AFCRL-70-0428

A MARC II BASED SYSTEM: STUDIES ON THE AIR FORCE CAMBRIDGE RESEARCH LIBRARY BIBLIOGRAPHIC PROCESSING SYSTEM

Liam M. Kelly

INFORONICS, INC.

146 Main Street

Maynard, Massachusetts 01754

Contract No. F19628-68-C-0371

FINAL REPORT

Period Covered: June 1, 1968 through May 31, 1970

21 July 1970

Contract Monitor: Richard J. Talbot, Research Library

Prepared For:

AIR FORCE CAMBRIDGE RESEARCH LABORATORIES

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ABSTRACT

This report describes the system development and testing conducted by Inforonics Inc. for the AFCRL library, under contract No. F19628-68-C-0371. This involved development of a system to provide AFCRL with a totally compatible MARC II format bibliographic data handling system.

The central focus of the project was on data encoding and the development of routines, and techniques for the conversion of AFCRL and/or Library of Congress supplied bibliographic data into a machine readable information record format based upon the Library of Congress MARC II Communications Format. Under this contract that system was developed, programmed, and tested.

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TABLE OF CONTENTS

1. INTRODUCTION

1.1 HISTORY

The final report on contract AF19(628)-5962 recommended that the AFCRL Library follow Library of Congress cataloging practice and the Library of Congress MARC format. This recommendation was accepted by the AFCRL administration and plans were made to abandon the library's own Machine Interpretable Natural Format (MINF) in favor of the then emerging national standard MARC format of the Library of Congress.

Originally their plan was to use the MARC I format and later on convert to MARC II when the MARC II system had become operational. There was, of course, the problem of the unique requirements of the AFCRL library, these would not be included in MARC II. The interim contract No. F-19650-67c-0313 addressed itself to some of these basic problems. This involved studies on the format for the AFCRL bibliographic data and the character set requirements. That final report recommended that the idea of adopting the MARC I format be dropped in favor of waiting a little bit longer for MARC II. It also recommended the acceptance of the proposed Library of Congress character set. At this same time, preliminary program specifications were formulated to enable the AFCRL computer center to process the bibliographic data files that would be generated by the library and Inforonics, Inc. Most of that contract's emphasis was devoted to MARC II studies. In that report, the Inforonics

Master File Structure and the Inforonics' Master File representation of character codes were described. Preliminary program specifications were included for programs including:

1. A program that would create the desired AFCRL DCS format from the Inforonics file format; and,
2. A line printer program to reformat data for card printout.

As a result of this, a three year contract, No. F19628-68-C-0371, was drawn up. Aimed at the development of an operational AFCRL MARC II system, the contract was intended to run from June 1, 1968 through May 31, 1970. The contract was aimed at developing the basis for a totally automated library system. Its objectives were summed up in Item 1 of the contract's work statement, namely to: "Conduct investigations and perform required analysis of data encoding to develop routines, and techniques, for the conversion of AFCRL and/or Library of Congress supplied bibliographic data into a machine readable information record format based upon the Library of Congress MARC II Communications Format for bibliographic data." This item was subdivided to provide for the subsequent development of automated procedures to cover all the normal library operations as well as some non-standard operations such as an SDI system.

Early emphasis of the contract was devoted to overall systems studies and to the development of an interim production system that would permit the encoding of MINF data from MARC worksheets in order to generate cards and labels for AFCRL's ongoing acquisitions. Before the contract efforts had really gotten underway, the AFCRL management concluded that they might "profitably increase ... efforts to modernize and automate the AFCRL library". The vehicle for accomplishing some of this modernization would be the existing contract. Specifically, there were two requirements involved:

1. The classification of the total bound serials collection; and,
2. The reclassification and recataloging of the monograph collection.

By emphasizing these aspects of the system, two things would be accomplished:

1. The AFCRL library system would be compatible with the Library of Congress; and,
2. A machine readable file of the library's complete holdings would be created without which a totally automated system would not be feasible.

Number 1. has been accomplished and, while number 2. was not completed in this contract, a very substantial machine file was created.

In order to accommodate the added expense of these operations, the contract was compressed into a two year period, thereby truncating one year from the term of the contract.

1.2 SUMMARY

The effort of the contract as it was implemented can be broken down into four phases, i.e:

Phase 1: Overall studies and analysis necessary to the development of a Library of Congress MARC II based bibliographic data processing system which would accommodate both the Library of Congress and the AFCRL locally generated data.

Phase 2: Creating necessary programs to interface with the standard Inforonics TPS production system specifically phase 1.

Phase 3: Testing and implementation of the monograph recataloging and reclassification project.

Phase 4: Specifications, testing, and implementation of serials reclassification project.

1.3 WORK PERFORMED

Under this contract which began on May 20, 1968 and ended on May 31, 1970, the system design and program specifications begun under Contract No. F19650-67c-0318 were completed.

For the monograph processing system, an expanded version of the Inforonics' TPS (Text Processing Service) Master File Generator was written in order to accommodate the MARC II file structure. Other TPS programs, including paper tape conversion, line printer, and file processing programs which generate card sets and labels were setup to accommodate the particular input and output data format needs of the AFCRL library. Testing of these programs began midway through the contract. In addition to setting up the programs, systems and procedures governing the actual input process were drawn up and all necessary forms were designed. The input worksheets were designed and the instructions for typists were written. All of these items were thoroughly tested and a file of approximately 8,000 records created.

Substantial work was also conducted on the serials processing system. A program was specified to convert the serials holdings data and the classification data from punched cards to paper tape. This data was used for two purposes:

1. It was used to create spine labels for the bound serials collection (all of which were applied during the Summer of 1969.); and,
2. It was used to facilitate the actual relocation of the bound serials collection.

In summary, a fully compatible MARC II bibliographic processing capability was developed. Output files from the system have been tested in the production of catalog end processing products, as well as in the acquisitions support processing at the AFCRL Computer Center.

This report describes the system and the programming involved. It also describes the testing that was conducted.

2.1 SYSTEM DESCRIPTION

The processing system as it is described in this report has been designed to "modernize and automate" the AFCRL library. The system is fully compatible with the Library of Congress MARC II format and uses the existing computer processing capability of the Inforonics' TPS system. The system allows for:

1. Local creation of MARC II format bibliographic files.
2. The integration of these files with the MARC tapes from the Library of Congress.
3. The manipulation of these data files to create
   a) Catalog and end processing products, including catalog cards, book labels, spine labels; and,
   b) Listings in support of processing.
4. Data tapes in support of an automated circulation system.

2.2 THE DATA BASE

The data base itself is a modified version of MARC II. The output files are 100% compatible with Library of Congress MARC II. Provisions are made in the format to accommodate local needs. The MARC II format includes item numbers for the:

Local systems number - 035

Local call number - 090

Local subject headings - 090

Plus, a reserved block (900) for local use

It was decided to bypass this scheme in favor of another system which would provide greater flexibility and ease in data tagging and manipulation, e.g., local subject headings are tagged just like Library of Congress data with the addition of a local indicator, "sutl.xy". This system allows for the identification of every item as local. At the same time, the input and the master file representations of tags for local data provide the same degree of item identification that is provided in the MARC II format for Library of Congress data. Within the master file, a tag (or item number) for local data resembles the tag for the equivalent Library of Congress data; the difference being that a bit is turned on when the data is local. This system allows for ease in the data's manipulation since any bit can be masked whenever the same processing is required for the local and the Library of Congress data. It also provides the capability to include similar Library of Congress data in the file but not in the printed products, e.g., a Library of Congress imprint and the modification to that imprint to match the particular edition held in AFCRL library.

These provisions enable the AFCRL library to maintain a complete Library of Congress record and, if they choose, to add AFCRL data to it; besides it allows for the ability to distinguish pure Library of Congress data from AFCRL data and, at the same time, to have all the data identified consistently.

Provisions were specifically made for the following AFCRL data elements:

Subject Headings

Added Entries

Bibliographic Notes

Location (Marking) Notes

Descriptors

Call Number

Location Symbols

Copy Numbers

Volume Numbers

System Number

Accountability Number

Accession List Indicator

Suppress Catalog Cards Indicator

This data base is currently stored on magnetic tape.

2.3 COMPUTERS

There are three computers used in the Inforonics' TPS system, all made by Digital Equipment Corporation. These are a PDP-1, a PDP-9, and the more powerful time shared PDP-10/50 (located at the ISC Service Bureau in Braintree). For its line-printing operation, Inforonics uses another service bureau's IBM 360/40 which drives an IBM 1403 line printer. The reason for this is the high quality of line printing required in the output products. Cards* printed on this machine

---

*See appendix

using medium weight, 100% rag stock are outstandingly superior to cards printed on any other machine, whether one used a medium weight or a light weight stock.

2.4 PROGRAMS

There are nine distinct machine operations involved in the AFCRL processing. These are shown on the accompanying flow charts (Tables 20 through 23) and each operation is described below.

2.4.1 Paper to Magnetic Tape:

The paper tape output from the Friden Flexowriter is converted to TPS compatible master file codes (the output tape is still in input format). This program implements a number of verifications and editing operations in the process of conversion, these include error messages for parity errors, synchronization errors, illegal code shifts, repetition of an identical character more than once, lines and records deleted, etc.

2.4.2 MF Code → MF Line Print Code:

This program accepts the output file from the previous program and converts it to a code which can be printed on an IBM 360/40, using an IBM utility print program.

2.4.3 Master File Generator:

A duplicate of the output file from 2.4.1 is processed on a PDP-10/50. This is the core program in the generation of MARC II records. Two files are output - a formatted file and an error listing. (See Tables 1 and 2) The data is processed through the program twice. The first time the program is used, it is done for the purpose of verification and the generation of an error listing which is incorporated into the proofreading process at that stage. After the input file is completely edited, the Master File Generator process is repeated. This time the second output from the program, a re-formatted file, is passed on for further processing. The Master File Generator accepts the output of 2.4.2, verifies each field, and outputs two disc files. One contains all the correct records, the other contains the error messages. Both files are in Informonics' TPS Master File (Packed Mapped) format.

The TPS internal format uses a "mapped" record structure wherein the tags, plus the address (pointer) of the data field relative to tne starting position of the first data field, are placed in a map (or directory) at the front of the record. The data fields follow this map. The map can contain a maximum of 100 entries (one entry per tag) and data fields are limited to 3,000 characters per physical record. In those instances where the record length exceeds 3,000 characters, continuation records are automatically generated.

```
#0006(6)
001102/0000 007100/0016 010110/0030 040010/0041 110510/0116 114000/0353
140000/0435 340011/0465 012000/0524 020200/0552 000100/0566 654564/0674


0000  IN 69000081A -
0016  ØAT69-114-
0030  ØAENGFRE-
0041  ØA↑COLETTE, ↑SIDONIE ↑GABRIELLE ØD1873-1954.-
0116  ØA↑EARTHLY PARADISE;ØBAN AUTOBIOGRAPHY,ØCDRAWN FROM HER LIFETIME W
      RITINGS BY ↑ROBERT ↑PHELPS. ↑TRANSLATED BY ↑HERMA ↑BRIFFAULT, ↑DER
      EK ↑COLTMAN, AND OTHERS.
0353  ØA↑NEW ↑YORK,ØB↑FARRAR, ↑STRAUS & ↑GIROUX,ØC1966.-
0435  ØAXXXIV, 505 P.ØC22 CM.-
0465  ØA↑PHELPS, ↑ROBERTØD1922-ØEED.-
0524  ØA↑P↑Q2605.↑02↑SB↑Z5-
0552  ØA848.91203-
0566     65023837 -
0603  690430S1966     NYU       V1    00000 ENG0 NAM  22 -
0664  """""""""""""
TOTAL  0674
```

MASTER FILE DATA

TABLE 1

```
#1
MFG-- 691111    REJT
SYS    AF 69-001586
CRD       68-060028
MISDEL    SET@ ↑U.↑S. ↑NATIONAL ↑BUREAU ØF ↑STANDARDS.@↑APPLIED MATHEMA
THICS
       SERIES,@60


#2
MFG-- 691111    REJT
SYS    AF 69-001605
CRD       65-016171
MISBIL/T AFCNA@T   ↑BUNKER-↑RAMØ ↑CORPØRATIØN, ↑STAMFØRD, ↑CONN.
```

ERROR LISTING FROM MASTER FILE GENERATOR

TABLE 2

The Library of Congress MARC II communications format also uses a "mapped" record structure. The control information that accompanies each tag entry in their map, however, consists of the length of the data field that the tag identifies as well as the address of that data field relative to the starting position of the first data field. In the TPS internal format, the map does not contain the length of the data field (the length can be generated when desired).

In the Library of Congress communications format, the tag identifying each field is in the map (directory). The indicators which further identify each field occupy the first two positions in the data field. The TPS tag, on the other hand, identifies the data field completely, e.g., tag and indicator. The 18 bits appear as the tag representation in the map in the TPS MF format. Having the indicator expressed along with the tag in the map eliminates looking at the data fields to determine if certain processing functions are to be performed. For example, certain operations are performed when the main entry is the subject of the book. This information is shown by an indicator that is in the data field in the Library of Congress record. By having this information in the map, processing is simplified, thereby lending greater efficiency to the machine processing.

The data contained in the leader of the LC MARC record, which cannot be generated atuomatically, is contained in the variable fixed field of this TPS format.

The verification functions of the Master File Generator are aimed at catching keying and tagging errors. They presently catch almost all of the tagging errors and some keying errors. These error messages are listed in the appended list.

At completion, the program types out the number of input and output records, and the number of parity errors and illegal characters. It also gives analytic error totals. (See Table 3.)

2.4.4 Line Printer:

All printing is done on an IBM 360/40, using an IBM utility print program. There are three printing passes of the file, the first two for listing purposes (see Tables 4 and 5) and the third for final formatted printing.

2.4.5 MAGSCO:

This is an editing operation that uses a Tektronik Storage Tube display that is "on line" to a PDP-9. Keyboard edit commands are entered on a TTY model 33. Final output from MAGSCO is a completely corrected data file. This operation is performed twice in the initial input operation. Using the marked up listings from the proofreader (see Tables 4 and 5) an editing specialist displays the data record by record on the scope. All editorial instructions found on the proofed listing are implemented into the "live text". Corrections are verified by the editor.

GGGGEGEGGGGGGGGGEGEEGGGGGGGGGEGGGGGGGEEGEGEGGGGGEGGGGGGGGGGGGGGGGGGGGG
GGGGGGGGGGGGEGEGGGGGGGGGGGGGG
MFG END

LIB.	GOOD	REJECT	TOTAL	
AF	87	13	1ØØ	
TOTAL	87	13	1ØØ	RUN TIME: 1Ø SEC.

ILDATA	4	
MISDEL	2	
ILLBLK	3	
MISTAG	1	
MISDAT	4	
	TOTAL	14

TOTAL AND STATISTICS FROM THE MASTER FILE GENERATOR

TABLE 3

1	sys	af69-9851a
2	act	F68-13179
3	lanx	englat
4	loc	2.c.1
5	loc	2.c.2 4.x
6	meps$d	Copernicus, Nicolaus,$1473-1543.
7	tila$bc	Three Copernican treatises:$the Commentariolus of
8		Copernicus, the Letter against Werner, the Narratio
9		prima of Rheticus.$Translated with introd. and notes
10		by Edward Rosen.
11	edn$b	2d ed.,$rev., with an annotated Copernicus bibliography,
12		1939-1958.$New York,$Dover Publications$[1959]
13	col$bc	x, 283 p.$diagrs.$21 cm.
14	bib	Bibliography: p.[197]-269.
15	sut$y	Astronomy$Early works to 1800.
16	sups$dt	Werner, Johannes,$1468-1528.$De motu octavae sphaerae.
17	aepsn$dt	Rhaa5ticus, Georg Joachim,$1514-1576.$Narratio
18		prima.
19	aepss$de	Rosen, Edward,$1906-$ed. and tr.
20	cal$b	QB41$.C84 1959
21	ddc	520.81
22	crd	60-1660
23	rtd	3.s 4.1959 6.nyu 7.a 14.x 17.m
24	∂∂	

MARKED UP PROOF LISTING

TABLE 4

```
1    sys          af69-9861a
2    act          F68-13179
3    ianx         englat
4    loc          2.c.1
5    loc          2.c.2          4.x
6    meps°d       Copernicus, Nicolaus,°1473-1543.
7    tila°bc      Three Copernican treatises:°the Commentariolus of
8                 Copernicus, the Letter against Werner, the Narratio
9                 prima of Rheticus.°Translated with introd. and notes
10                by Edward Rosen.
11   edn°b        2d ed.,°rev., with an annotated Copernicus bibliography,
12                1939-1958.
13   imp°bc       New York,°Dover Publications°(1959)
14   col°bc       x, 283 p.°diagrs.°21 cm.
15   bib          Bibliography: p.(197)-269.
16   sut°y        Astronomy°Early works to 1800.
17   sups°dt      Werner, Johannes,°1468-1528.°De motu octavae spharae.
18   aepsn°dt     Rha@a5ticus, Georg Joachim,°1514-1576.°Narratio
19                prima.
20   aepss°de     Rosen, Edward,°1906-°ed. and tr.
21   cal°b        QB41°.C84 1959
22   ddc          520.81
23   crd          60-1660
24   ffd          3.s            4.1959         6.nyu          7.a            14.x           17.m
25   @@
```

SECOND PROOF LISTING

TABLE 5

After the editing pass is complete, the total file is again line dumped for verification by the proofreader. Subsequent to this verification, the editorial operation is repeated.

2.4.6 Catalog Products/Processing Program CP/PP:

CP/PP accepts the output of the Master File Generator and generates for each input record, three types of output records:

1. A record for each item required for a complete set of cards.
2. A spine label record for each physical volume.
3. A pocket label record for each physical volume.

Each type of record is output onto a separate file. The data on these files is modified by the requirements on the AFCRL profile. The profile contains information about the AFCRL processing specifications, including:

1. Oversize determinations.
2. Oversize symbols.
3. An indicator for spine label production.
4. An indicator for pocket label production.
5. Conventional title treatment.
6. An indicator for treatment of main entry as subject.
7. A list of valid shelf locations giving the card and label requirements.

As each record is processed, the program examines the library's profile and performs the operations specified. The profile information is contained in Table 6.

CP/PP performs a number of processing functions on the bibliographic data, including the following:

1. Generation of overprint headings from tracings, titles, and marking notes.
2. Generation of tracings for title and series entries when the overprint headings are taken from the title and series statements.
3. Generation of the appropriate number of main entries, added entries, subject entries, and shelf list cards from the profile and tracings data.
4. Generation of the appropriate Arabic or Roman numeral to be printed before each tracing.
5. Break-up of the Library of Congress call number string into segments which can be printed in the margin of the cards and on the labels.
6. Generation of a record for each label from the statement of copies and volumes.
7. Addition of the library's location symbols (including oversize when appropriate) to the call number.

The program terminates by typing the number of input records and the number of output records generated. The output from CP/PP is passed to the formatting programs.

AFCRL PROFILE

1. Library symbol printed on catalog cards AF

2. Selin labels generated? Yes

3. Book card (or pocket) labels generated? Yes

4. Conventional Titles to appear? Always when present

5. Subject added entries made when main entry is subject? Yes

6. Location Symbols	Type	Card Requirement Formula			
		Main Entry	Added Entry	Subject Entry	Shelf List
ABS	Special Shelf	1	1	1	1
REF	" "	1	1	1	1
RES	" "	1	1	1	1
DELTA	" "	1	1	1	1
RARE	" "	1	1	1	1
TER	" "	1	1	1	1
MAP	" "	1	1	1	1
PHONO	" "	1	1	1	1

7. Oversize determination

   Regular 1-28 cm

   Oversize 29+

8. Oversize symbol OVSZ

Table 6

2.4.7 Catalog Card Formatting Program:

The catalog card formatter accepts as input the disc file of catalog records that has been output by CP/PP. and formats the data contained in each record into a card image (or images if the record extends to more than one card). Each card image is output as a separate record onto magnetic tape.

The format of the cards generated (see appendix) intentionally resembles the format of typed cards intended for reproduction via the traditional unit card method.

In the eventual system, it may be desirable to replace the card form of catalog with a book form catalog and only use this record format as a periodic supplement to the book form. This is something which will be very feasible once the total data base has been converted to machine form.

2.4.8 Charge Card Formatter:

The input for this program is the disc file of abbreviated label records output by CP/PP. Each record is in TPS internal format and contains a call number, location symbols, if present, a copy number if more than one copy is owned, a volume number if it is a multivolume work, and abbreviated author and title data.

The output of this program is duplicated and run on continuous form pressure sensitive labels which are later applied to book pockets and circulation cards.

2.4.9 Spine Label Formatter:

The input for the Spine Label Formatter is the disc file of spine records output by CP/PP. Each input record is in the same TPS format and contains a call number, location symbols if present, a copy number if more than one copy is owned, and a volume number if it is a multivolume work. For samples of the two types of labels, see appendix.

3. INPUT PROCEDURES

Batches of blank worksheets are sent periodically to the AFCRL catalog department. As books are processed, a catalog record is affixed to a worksheet (see Table 7), the control data is assigned and the fixed field data is supplied. The cataloger's authority here is the "Instructions for Worksheet Preparation".* These in-process worksheets are then batched in groups of 25 and picked up by the Inforonics' courier on a weekly basis. The books are placed on the in-process shelves.

Upon receipt of the week's batches by the Inforonics' project monitor, they are checked into the system and relayed to the tagging personnel.

3.1 TAGGING

Batches are tagged on a current basis. The tagging authority is a slightly modified version of the Library of Congress tagging manual. (For summary of these tags, see Table 8 through 13) Tagging is performed by people who, while not professional librarians, generally possess a batchelor's degree in the humanities. These modifications to the MARC manual facilitate tagging by such personnel, e.g., implicit identification blocks are not used, fixed spaces are never inserted in the input tag, etc. At this stage, the control data and fixed field data is verified. From here, the tagged worksheets (see Table 14) go to the typing pool.

---

*See Appendix

AFCRL MARC II WORKSHEET

		No acc	No mf
sys	af69-7458		
act	F68-03356		
cat			
lan	fre		
call			

Valid location symbols

ABS
REF
RES
DELTA
RARE
TER
PHONO

	Location Symbol(s)	Copy No(s)	Vol No(s)	No Cd	No S	No Bk	X ME
loc	1.	2.	3.	4.	5.	6.	7.
loc	1. REF	2. C.2	3.	4. X	5. X	6.	7.
loc	1.	2.	3.	4.	5.	6.	7.
loc	1.	2.	3.	4.	5.	6.	7.

Jurain, Georges.

Contribution à la connaissance géochimique des familles de l'uranium-radium et du thorium dans les Vosges méridionales; application de certains résultats en prospection des gisements d'uranium. [Nancy, Fondation scientifique de la géologie et de ses applications, 1962]

340 p. illus., maps (1 fold.) 27 cm. (Sciences de la terre. Mémoires, no 1)

On cover: Annales de l'École nationale supérieure de géologie appliquée et de prospection minière de l'Université de Nancy et du Centre de recherches pétrographiques et géochimiques (C. N. R. S.)

Bibliography: p. 285-297.

1. Radioactive substances—France—Vosges Mountains. (Series)

QE1.S1955 no. 1 70-8280

Library of Congress 69 [2]

Continuation Worksheets? _____ (If yes, fill in ffd, etc. on last sheet only.)

ffd	ME/Body 1.	Pub/ME 2.	Date Key 3. 0	Date 1 4. 1962	Date 2 5.	Country 6. fr	Type 7. a
	Juv. 8.	Repro 9.	Contents 10.	Govt.Pub. 11.	Meet/C 12.	Fest. 13.	Index 14.
	Fict. 15.	Biog. 16.	Bib.Level 17. m	Mod.Rec. 18.	Sub/ME 19.	Suppl.# 20.	NAL/NLM 21.

Tag	Data
___	_____
___	_____
___	_____

TABLE 7

August 22. 1969

INFORONICS

MARC II MNEMONIC INPUT TAGS AND SUBFIELD CODES*

sys	Systems No.	
act	Accountability No.	
cat	Cataloging Source (if not LC)	
loc	Location - Copy Statement	
call	Local Call Number **	
lan	Language	●a of work ●b of summaries
[X]	[Translation]	
ffd	Fixed Field Data	
crd	LC Card Number (Control No.)	
nbn	National Bibliography Number	
sbn	Standard Book Number	
pln	Overseas Acquisition Number	
sco	Search Code	
cal	LC Call Number	●a class number ●b book number
[X]	[Not in LC]	
cop	Copy Statement	●a class number ●b book number ●c copy number
[X]	[Not in LC]	
nlm	NLM Call Number	●a class number ●b book number
nal	NAL Call Number	●a class number ●b book number
asc	NAL Subject Category Number	
udc	Universal Decimal Classification Number	
bnb	British National Bibliography Classification Number	
ddc	Dewey Decimal Classification Number	

*The first ●a subfield code is inserted by the program.
**Used only with LC cataloging copy, to override the call number established at LC.

TABLE 8

MAIN ENTRY

mep	Personal Name		•a	name
			•b	numeration
	f	Forename	•c	titles
			•d	dates
	s	Single Surname	•e	relator
			•k	form subheading
	m	Multiple Surname	•t	title (of book)
	n	Name of family		
mec	Corporate Name		•a	name
			•b	subordinate unit
	s	Surname	•e	relator
			•k	form subheading
	p	Place and Name	•t	title (of book)
	n	Name		
mem	Meeting/Conference		•a	name
			•b	number
	s	Surname	•c	place
			•d	date
	p	Place and Name	•e	corporate subheading
			•g	misc. information
	n	Name	•k	form subheading
			•t	title (of book)
meu	Uniform Title		•a	uniform title heading
			•t	title

SUPPLIED TITLE

uti	Uniform (Conventional) Title	
	n	Not on LC Cards
	a	On LC Cards
rom	Romanized Title	
	n	No Added Entry
	a	Make Added Entry
tra	Translated Title	

TITLE PARAGRAPH

til	Title Statement		•a	short title
			•b	remainder title
	n	No Added Entry	•c	remainder t.p. transcription
	a	Make Added Entry		

TABLE 9

edn	Edition Statement	•a	edition
		•b	additional information
imp	Imprint	•a	place
		•b	publisher
		•c	date
col	Collation	•a	pages or volumes
		•b	illustrations
		•c	height
pri	Bibliographic Price		
cpr	Converted Price		

SERIES NOTE

Series Traced the Same

sep	Personal Name	•a	name
		•b	numeration
		•c	titles
		•d	dates
		•e	relator
		•k	form subheading
		•t	title of series
		•v	volume or number

f	Forename
s	Single Surname
m	Multiple Surname
n	Name of Family

sec	Corporate Name	•a	name
		•b	subordinate unit
		•e	relator
		•k	form subheading
		•t	title of series
		•v	volume or number

s	Surname
p	Place and Name
n	Name of Family

sem	Meeting/Conference	•a	name
		•b	number
		•c	place
		•d	date
		•e	corporate subheading
		•g	misc. information
		•k	form subheading
		•t	title of series
		•v	volume or number

s	Surname
p	Place and Name
n	Name of Family

set	Title	•a	title
		•v	volume or number
sen	Series Not Traced		
sed	Series Traced Differently		

TABLE 10

BIBLIOGRAPHIC NOTES

gen General Notes

bnd "Bound with" Notes

dis Dissertation Notes

bib Bibliographic Notes

con Contents Notes

c	Complete
i	Incomplete
p	Partial

mar Marking Notes

lac Library Lacks

ann Abstract of Annotation

SUBJECT ADDED ENTRIES

sup Personal Name .....

f	c	Forename	Children
s	m	Single Surname	Medicine
m	a	Multiple Surname	Agriculture
n		Name of Family	

- ●a name
- ●b numeration
- ●c titles
- ●d dates
- ●e relator
- ●k form subheading
- ●t title (of book)
- ●x general subdivision
- ●y chron. subdivision
- ●z place subdivision

suc Corporate Name .....

s	c	Surname	Children
p	m	Place and Name	Medicine
n	a	Name	Agriculture

- ●a name
- ●b subordinate unit
- ●e relator
- ●k form subheading
- ●t title (of book)
- ●x general subdivision
- ●y chron. subdivision
- ●z place subdivision

sum Meeting/Conference .....

s	c	Surname	Children
p	m	Place and Name	Medicine
n	a	Name	Agriculture

- ●a name
- ●b number
- ●c place
- ●d date
- ●e corporate subheading
- ●g misc. information
- ●k form subheading
- ●t title (of book)
- ●x general subdivision
- ●y chron. subdivision
- ●z place subdivision

TABLE 11

suu Uniform Title .....

c		Children
m		Medicine
a		Agriculture

- ●a uniform title heading
- ●t title
- ●x general subdivision
- ●y chron. subdivision
- ●z place subdivision

sut Topical .....

p	c	Place Entry		Children
	m			Medicine
	a			Agriculture

- ●a main heading
- ●b name (after place)
- ●x general subdivision
- ●y chron. subdivision
- ●z place subdivision

sug Geographic Name .....

p	c	Place Entry		Children
	m			Medicine
	a			Agriculture

- ●a main heading
- ●b geog. name after place
- ●x general subdivision
- ●y chron. subdivision
- ●z place subdivision

OTHER ADDED ENTRIES

aep Personal Name .....

f	a	Forename	Alternative
s	s	Single Surname	Secondary
m	n	Multiple Surname	Analytical
n		Name of Family	

- ●a name
- ●b numeration
- ●c titles
- ●d dates
- ●e relator
- ●k form subheading
- ●t title (of book)
- ●u filing information

aec Corporate Name .....

s	a	Surname	Alternative
p	s	Place and Name	Secondary
n	n	Name	Analytical

- ●a name
- ●b subordinate unit
- ●e relator
- ●k form subheading
- ●t title
- ●u filing information

aem Meeting/Conference .....

s	a	Surname	Alternative
p	s	Place and Name	Secondary
n	n	Name	Analytical

- ●a name
- ●b number
- ●c place
- ●d date
- ●e corporate subheading
- ●g misc. information
- ●k form subheading
- ●t title
- ●u filing information

TABLE 12

aeu	Uniform Title		•a	uniform title heading
			•t	title
s		Secondary	•u	filing information
n		Analytical		

aed Title Traced Differently

s	Secondary	

SERIES ADDED ENTRIES

sap	Personal Name		•a	name
			•b	numeration
f	Forename		•c	titles
			•d	dates
s	Single Surname		•e	relator
			•k	form subheading
m	Multiple Surname		•t	title of series
			•v	volume or number
n	Name of Family			
sac	Corporate Name		•a	name
			•b	subordinate unit
s	Surname		•e	relator
			•k	form subheading
p	Place and Name		•t	title of series
			•v	volume or number
n	Name			
sam	Meeting/Conference		•a	name
			•b	number
s	Surname		•c	place
			•d	date
p	Place and Name		•e	corporate subheading
			•g	misc. information
n	Name		•k	form subheading
			•t	title of series
			•v	volume or number
sat	Title		•a	title
			•v	volume or number

TABLE 13

9/69

AFCRL MARC II WORKSHEET

		No acc	No mf
sys	af69- 8643	a1	
act	F68-11263		
cat			
lan	eng		
call			

Valid location symbols

ABS
REF
RES
DELTA
RARE
TER
PHONO

	Location Symbol(s)	Copy No(s)	Vol No(s)	No Cd	No S	No Bk	X ME
loc	1.	2. c1	3.	4.	5.	6:	7.
loc	1.	2. c.2	3.	4.X	5.	6.	7.
loc	1.	2.	3.	4.	5.	6.	7.
loc	1.	2.	3.	4.	5.	6.	7.

QA
404
J2

~~17.35~~ maps.d
Jackson, Dunham, 1888–
tila.c — Fourier series and orthogonal polynomials, by Dunham Jackson. — Oberlin, O., The Mathematical association of America, (1941) imp.bc
col.bt xii p., 1 l., 234 p. diagrs. 19½ cm. set.✓ The Carus mathematical monographs, no. 6
bib "Bibliography of suggestions for supplementary reading": p. 229–230.

sut Fourier's series. sut Functions, Orthogonal. sec.na. Mathematical association of America. ~~Orthogonal polynomials.~~ Orthogonal polynomials, acds

~~W. Gordon~~

~~Library of Congress~~ — cal.b QA404.J2 — 41—24829 crd

~~42y8r~~ ddc 517.35

Continuation Worksheets?_____(If yes, fill in ffd, etc. on last sheet only.)

ffd	ME/Body	Pub/ME	Date Key	Date 1	Date 2	Country	Type
	1. X	2.	3. 1	4. 1941	5.	6. ohu	7. a
	Juv.	Repro	Contents	Govt.Pub.	Meet/C	Fest.	Index
	8.	9.	10.	11.	12.	13.	14. X
	Fict.	Biog.	Bib.Level	Mod.Rec.	Sub/ME	Suppl.#	NAL/NLM
	15.	16.	17. m	18.	19.	20.	21.

Tag	Data
___	_____
___	_____
___	_____

3.2 TYPING

AFCRL MARC data is keyed on Friden Flexowriter. The data is keyed using the prepared set of instructions for typists.* There is very little editing capability on these machines other than back-slash delete along with programmed line and record deletion codes. The paper tapes go from typing to the project monitor. The monitor prepares the first of four job orders for computer processing (see tables 15, 16, 17, and 18) and the paper tapes are then sent for computer processing.

3.3 CONVERSION AND PRINTING

These paper tapes are first converted to computer compatible magnetic tape and these tapes are in turn line printed. The printed listing is delivered to the proofreading department. At the same time, a copy of the input tape is processed by the Master File Generator. This process performs the equivalent of a proofreading for everything that is logically verifiable. One of the outputs from this program is an error listing (see Table 2) which is also given to the proofreader. These error messages will be incorporated into the first proofreading.

3.4 PROOFREADING

Proofreading is done using the line printed listing. The typeout from the Friden flexowriter is <u>not</u> used at all. Special codes for non-standard symbols, e.g., diacritics are still in the printed data at this time. The error messages from

---

*See Appendix

JOB ORDER FOR COMPUTER PROCESSING, I
MARC II NO. 1 (1st LISTING)
(Charge AFCRL - 162:56)

Batch No.(s)_____ Systems No.(s)_____ to_____Date:_____

Operation	Date	Time	Record Count	Char. Count	By	Output Tape #
1. (PDP-1) Run paper tape with Dura to Mag Program. Label output tape: a. AFCRL b. Batch nos. c. Date d. Operator e. Unedited MARC II		On Off				
2. (PDP-9) Run output mag tape from step 1 with Mag Tape Linedump Printer Program (editable version). Label output tape with standard label as in step 1. Affix 2nd label: 800BPI Even Parity Use "TN" Train Send to ISI (Wellesley).		On Off				
3. (PDP-9) Run the unedited output Mag tape from step 1 through MAGSCO Label output tape: a. AFCRL b. Batch nos. c. Date d. Operator Send to ISC (Braintree)		On Off				
4. (PDP-10) When tape from step 3 gets to ISC, run Programs: (on dec #203) DSK MAKE MFG. CDAT Scratch input & output tape from step 4 after PDP-10 processes.		By	Comments			
5. Return input paper tape, the teletype printout, this Job Order and ISI listing to Project Monitor (Gloria Nilsson).						

TABLE 15

JOB ORDER FOR COMPUTER PROCESSING, II
MARC II NO. 2 (2nd LISTING)
(Charge AFCRL - 162:56)

Batch No.(s)_____ Systems No.(s)_____ to _____ Date_____

Tape No. to be Corrected_____ (Unedited MARC II)

Operation	Date	Time	Record Count	Char. Count	By	Output Tape #
1. (PDP-9) Correct unedited Tape using MAGSCO. Label output tape: a. AFCRL b. Batch Nos. c. Date d. Operator e. 1st Edited MARC II		On Off				
2. (PDP-9) Run on output from step 1 with Line Printer Program (editable version). Label output tape with standard label as in step 1. Affix 2nd label with: 800BPI Even Parity Use "TN" Train 2 pt. paper Send to ISI		On Off				
3. Retain input and output tapes from Step 1.						
4. Return the corrected ISI listing, this Job Order, and the new ISI listing to Project Monitor (Gloria Nilsson).						

TABLE 16

JOB ORDER FOR COMPUTER PROCESSING, III
MARC II NO. 3 (2nd CORRECTING)
(Charge AFCRL - 162:56)

Batch No.(s)_____ Systems No.(s)_____ to_____ Date_____

Tape No. to be corrected_____ (Edited MARC II)

Operation	Date	Time	Log Out	By	Output Tape No.
1. (PDP-9) Correct Edited Tape using MAGSCO Label output tape: a. AFCRL b. Batch nos. c. Date d. Operator e. 2nd Edited MARC II		On / Off			
2. Duplicate output tape - with MAGSCO Label output tape with standard label ..s in step 1. Send to ISC (Braintree) Send labels (2 kinds) with output from step 2.		On / Off			

3. Retain the input and output tapes.

4. Return the listing and this Job Order to Project Monitor (Gloria Nilsson)

5. Operation PDP-10	By	Output Tape No.
Process output tape from step 1 when it reaches Braintree: Run DSK MAKE: Run DSK MFG: Run DSK CLPPA: Run DSK PUFF: a. Label output tape from PUFF: AFCRL LIB CARDS_____ 556 BPI Odd Parity		
Run DSK POLAFO: b. Label output tape from POLAFO: AFCRL BOOK POCKET LABELS_____ 556 BPI Odd Parity Process twice	Date	
Run DSK SELIN: c. Label output paper tape AFCRL _____, SELIN LABELS TO INFORONICS d. After labeling on 3 runs instruct PDP-10 operator to hold for Inforonics courier.		
6. Scratch input tape after PDP-10 Processes.		
7. Return teletype printout to Project Monitor.		

TABLE 17

January 21, 1970

JOB ORDER FOR COMPUTER PROCESSING, IV
MARC II No. 4 AFCRL UPDATE
(Charge AFCRL - 162:56)

Batch Nos._____ Date_____

Tape Nos. to be corrected_____

_____

Operation	Date	Time	Total Time	By	Output Tape #
1. Pull and/or correct records listed using PDP-9 Edited tape(s) using MAGSCO.		on / off			e(1) / e(2)

2. Label output tapes with following tape label identification:

   a. AFCRL
   b. Batch nos.
   c, Date
   d. Operator's intials
   e. Tape names
      (1) Updated combined MARC II
      (2) 3rd Edited (corr.) MARC II (Library cards)

3. Retain full edited updated tape from Step 1 e(1)

4. Send output tape from Step 1 e(2) to ISC (Braintree).

5. Retain input tapes until directed to scratch.

6. Operation PDP-10	by	Output Tape No.
Process output tape from Step 1 labeled e(2) when it reaches Braintree.		
Run DSK MAKE: Run DSK MFG: Run DSK CDAT: Run DSK CLPPA: Run DSK CDAT: (N/ CLPPE) Run DSK PUFF:	Date	

7. Label output tape from PUFF run: AFCRL Batch Nos._____ Date_____
   Library Cards
   556 BPI Odd Parity

TABLE 18

the Master File Generator are incorporated into the printed listing at this time. The marked up listing (Table 4) is now sent to the Inforonics' computer room.

3.5 THE EDITING OPERATION

All editing at Inforonics is performed on the Inforonics' TPS console Edit-Display System. The editing operation is done "on line" to a PDP-9 computer. The actual correction commands are inserted using keyboard entry. The edited file is then line-printed and this second listing is returned to the proofreader along with the original marked up listing. (Table 5)

3.6 VERIFICATION

All changes made to the file are verified by the proofreader. If any errors are remaining in the file at this point, the editing process is repeated. After this, the file is considered to be 100% accurate. Two copies of the final tape are made; of these, one goes to the PDP-10 for processing, and the other goes to the AFCRL computer center. The original is stored at Inforonics. The tape at this point is still in the raw data format.

3.7 PRODUCTION PROCESSING:

The programs that are used in the present production processing have been described in more detail in Section 2.4.

Although this file is presently being used to produce catalog cards and end processing products, it can be used to generate other products, e.g., a book form catalog.

3.7.1 Master File Generator:

The first step in production processing is the creation of a Master File Format record. This is done by the Master File Generator. Output from this program is a reformatted version of the input file (Table 1).

3.7.2 Data File Explosion:

The output from the Master File Generator is now exploded and all of the necessary records are produced for each title, i.e., a set of cards, the necessary number of circulation card labels, and spine labels. The output is three disc files.

3.7.3 Formatting:

These three output files are now processed to produce three formatted files. Two of these, card images and label images, are on magnetic tape, the third is a paper tape.

3.7.4 Printing:

The two magnetic tape files are printed onto continuous form stock, one onto card stock* (University Products, Medium weight 100% rag stock) and the other (the book pocket and circulation labels) onto pressure sensitive labels.* The paper tape is

---

*See Appendix

printed on a modified version of the Dura Mach 10 flexowriter using an Orator sphere. This operation produces continuous form Selin tape labels.*

3.7.5 Cutting:

Cards are die cut on a Nikor card cutter. Labels are sent to the AFCRL Library in their continuous form.

3.7.6 Sorting:

After being cut, the cards are separated and sorted into three categories:

a. Shelf List
b. Author and Title
c. Subject

At this point, the shelf list is supplemented in those instances where there are multiple holdings. Holdings cards (see Table 19) are prepared and these contain the call number, Main entry, and all related F numbers (the accountability number).

These cards and labels are sent to the library where end processing is carried out by Infonics' personnel. This includes labelling and filing. The complete process is shown in tables 20 through 23.

---

*See Appendix

Z
1201
A52

American book publishing record.

LIBRARY HAS:

1967: F68-01233
1968: F69-03979

HOLDINGS CARD

TABLE 19

INFORONICS TPS MARC II DATA CREATION

AND PROCESSING SYSTEM

Abbreviations:

H = Hard Copy

PT = Paper Tape

MT = Magnetic Tape

DF = Disc File

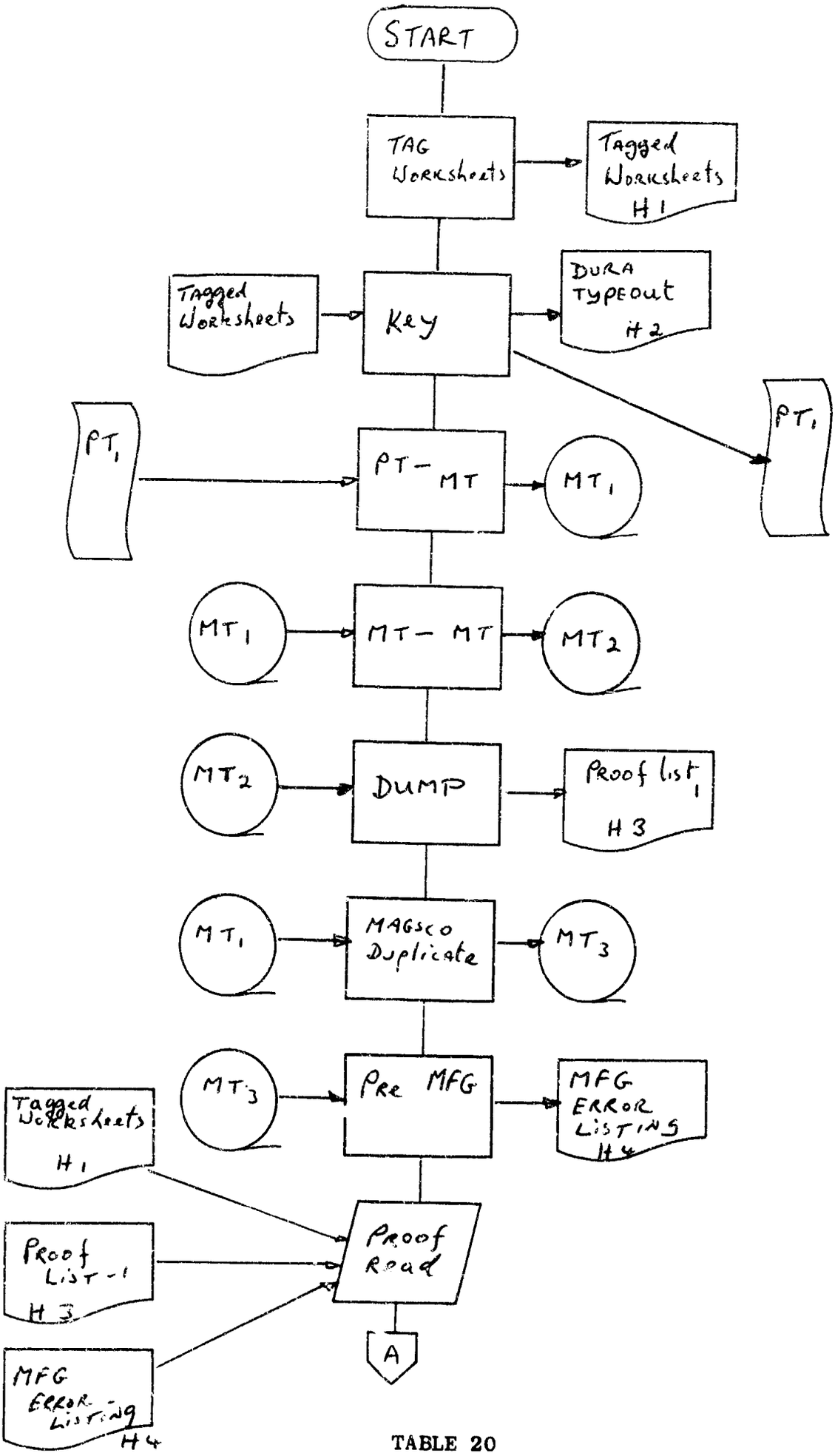

START
TAG Worksheets
Tagged Worksheets H1
Tagged Worksheets
Key
DURA TYPEout H2
PT1
PT1
PT - MT
MT1
MT1
MT - MT
MT2
MT2
DUMP
Proof list 1 H3
MT1
MAGSCO Duplicate
MT3
MT3
Pre MFG
MFG ERROR LISTINGS H4
Tagged Worksheets H1
Proof List-1 H3
MFG ERROR LISTING H4
Proof Read
A

TABLE 20

MT1
A
MAGSCO Edit
MT4
Proof list-1
H 3
MT4
MT → MT
MT5
MT5
DUMP
Proof list-2
H.5
Proof list-1
H.3
Proofread Corrections
Proof list-2
H.5
Proof list-2
H.5
MAGSCO Edit & Duplicate
MT6a
MT4
MT6a
MFG
DF1
DF1
CLPP
DF 2
DF 3
DF 4
B

TABLE 21

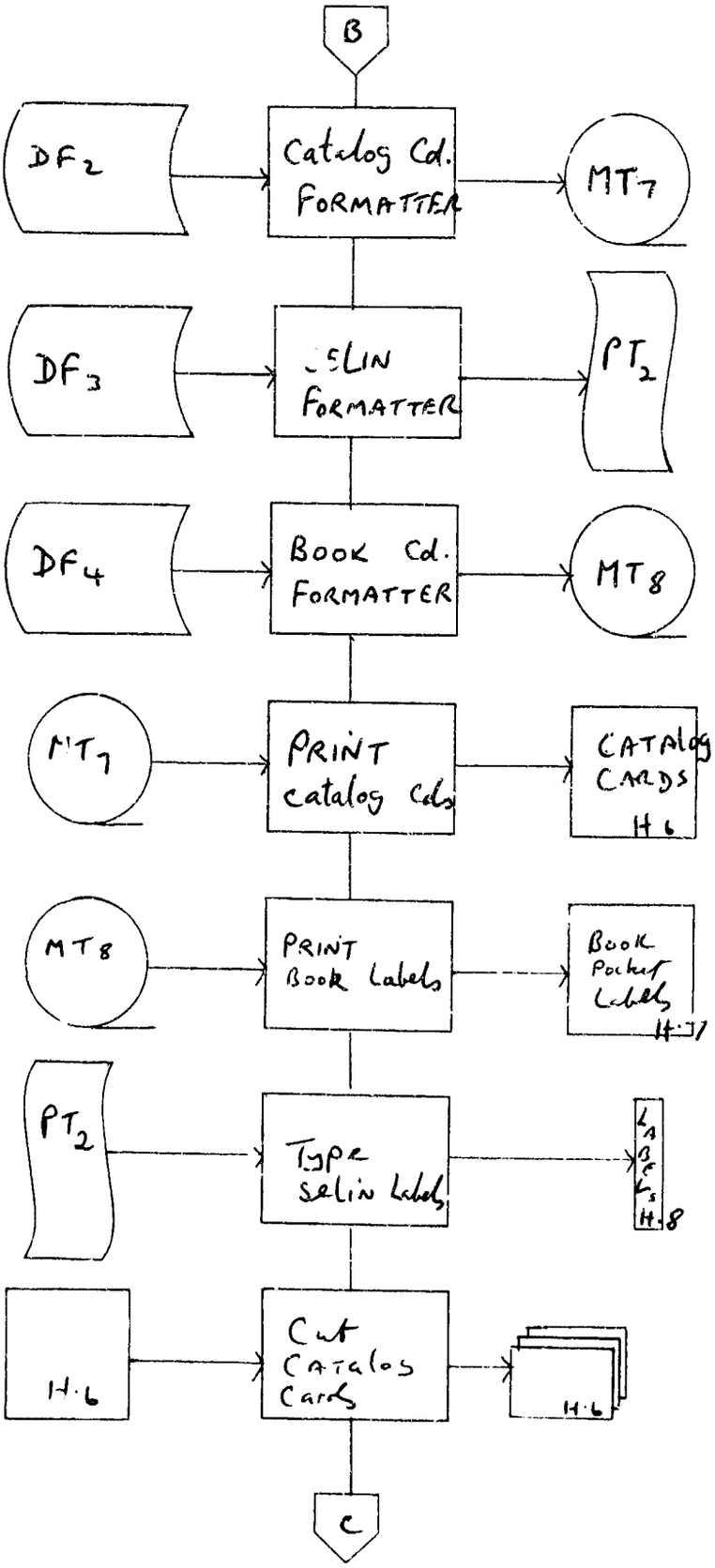

B
DF2
Catalog Cd. FORMATTER
MT7
DF3
SELIN FORMATTER
PT2
DF4
Book Cd. FORMATTER
MT8
MT7
PRINT catalog Cds
CATALOG CARDS
H.6
MT8
PRINT Book Labels
Book Pocket Labels
H.7
PT2
Type Selin Labels
LABELS
H.8
H.6
Cut Catalog Cards
H.6
C

TABLE 22

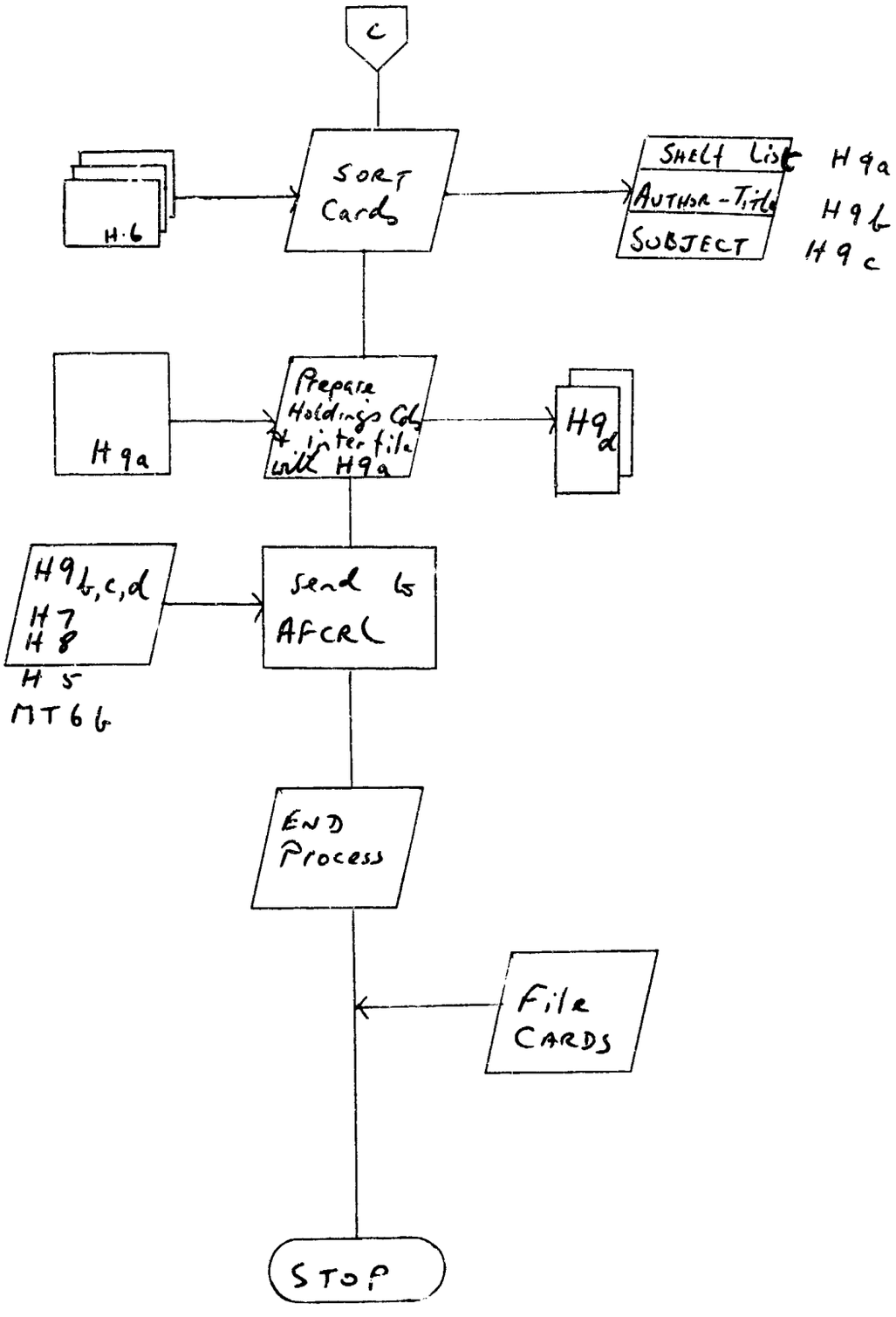

C
SORT Cards
H.6
SHELF List
AUTHOR-Title
SUBJECT
H 9a
H 9b
H 9c
H 9a
Prepare Holdings Col. inter file with H9a
H9d
H9b,c,d
H7
H8
H 5
MT 6 6
Send to AFCRL
END Process
File CARDS
STOP

TABLE 23

4. TESTING

During the first year of the contract, an interim card and label production program was in operation. This involved the double keying of data from the same manuscript, once in MARC II format and again in the earlier MINF format (Machine Internal Natural Format). The data keyed in the MINF format was used to generate catalog cards and book pocket labels for the current acquisitions. This system was used for approximately the first 1,000 records (through June, 1969), at which time the MARC II production system became operational. After that time, approximately another 7,000 records were processed through the system.

During the early phases of testing, a number of bugs showed up in the program setup, they have been eliminated. As cards were generated from the new system, they were first scanned by the project monitor and subsequently scanned by the catalogers in the AFCRL library. Errors fell into three categories:

1. Data errors (caused by erroneous input).
2. Data errors (due to faults in the Master File Generator).
3. Formatting errors (due to faults in the formatter programs).

Errors in categories 2. and 3. were returned to Inforonics, accompanied by a problem report. This report contained one copy of the erroneous card and a written description of the problem (Table 24). Gradually all of these problems were eliminated except for those problems that are intrinsic in the limitations of the printing format (e.g., ove print headings are limited to three lines - occasionally these headings require much more than three lines). Errors in category 1. continue to crop up and these corrections are handled in the course of the periodic file updata process (see Table 18).

Besides catalog products in hard copy, a machine readable record for every record processed has been sent to the AFCRL library. These data tapes are in the original input format, (see Table 5) suitable for processing at the AFCRL Computer Center in support of circulation and other operations.

In addition to this, "the feasibility of expanding the system to include Library of Congress MARC II data, together with local input of AFCRL data" was studied and the technical feasibility of doing this was established.

An updated cumulative MARC file is maintained by Inforonics, Inc. and it is estimated that this file could be searched to provide machine records for approximately 80% of current acquisitions at AFCRL. The cost of acquiring the machine record from MARC would be approximately 50¢ per record as opposed to the present cost of approximately $2.50 to create a machine record at Inforonics.

AFCRL MARC II PROBLEM REPORT

Date: 6/16/70 Sys. ~~Req.~~ No.: 6344

Description of Problem: (attach sample if possible)

L.C call no. was entered as ca/x
Call no. break correct but call no. did
not print out at bottom of card.

QA
9

Kleene, Stephen Cole, 1909-
Introduction to metamathematics.
New York, Van Nostrand, 1952.
550 p. 23 cm. (The University
series in higher mathematics)
1.Metamathematics. I.T.

af69-6344/a F68-07539

52-14593
510.1

Suggested Improvement:

Send to: Mr. Liam Kelly
Inforonics, Inc.
146 Main Street
Maynard, Massachusetts 01754

5. SERIALS RECLASSIFICATION

Prior to the implementation of changes in the course of this contract, the bound serials collection at the AFCRL Research Library was stored on the three floors of the main stacks, where it was arranged by broad subject category. These categories were - Psychology, Mathematics, Engineering, Astronomy, Ceramics, Electronics, Physics, Chemistry, Geology, Geo-physics, Photography, General Science, and Biology (Bibliographics and Library Literature were later added to the project). Within these categories, the volumes were arranged on a straight alphabetic basis. Serial records were maintained on 5 x 8 holdings cards and these were filed alphabetically. The total collection numbered about 107,000 volumes of which 1,100 were in the "rare books" category. Besides these serials records cards, there was the Master Serials Inventory list, a machine based listing which had been derived from the serial records cards. Each record on the listing contained the title of the journal, an abbreviated holdings statement, and the accountability number, plus occasional supplementary information. Early in the contract the AFCRL management decided this collection should be reclassified in the Library of Congress classification, in order to facilitate greater efficiency and control.

5.1 PRODUCTION SYSTEM

When the decision was made to reclassify according to the Library of Congress system, it was decided that this effort

should be limited to the bound volume collection, thereby eliminating about 30,000 volumes from the project. For the other 77,000, Selin labels had to be generated and applied.

It was decided that the best way to do this would be to punch the holdings data and class numbers onto Hollerith cards. Specifications* were written for a program that would convert punched cards to paper tape which, in turn, would drive a Dura Flexowriter, fitted with a Selin labelling attachment. Reclassification was conducted on the subject category basis. Each category was inventoried from the shelves and an inventory list drawn up (Table 25). As each category was reclassified, the holdings cards were xeroxed and the xerox copies (Table 26) along with the inventory list were sent to Inforonics. The flow chart in Table 27 shows the project procedures following the receipt of the holdings records from AFCRL.

5.2 IMPLEMENTATION

Cards were punched according to the specifications* on an IBM keypunch machine, Model 0026. One card was punched for each logical record (a bound volume). Each card was divided into four fields:

Field 1 - column 1-30 - class number

Field 2 - column 31-35 - volume abbreviation

---

*See Appendix

(LERO

*AIAA Bulletin	TL 501. A9 A25	6 ✓	000065 ✓
*ARS Journal	TA 780. A613	27 ✓	000285 ✓
*AIAA Journal	TL 501. A688 A2	30 ✓	000070 ✓
*Aerial age	TL 501. A2	9 ✓	017100 ✓
*Aero	TL 503 A33	1 ✓	017250 ✓
*Aero digest	TL 501. A292	9 ✓	017260 ✓
*Aero - Space	TL 502. A1523	2 ✓	017300 ✓
*Aeronautics	TL 502 A2	18 ✓	017700 ✓

ENTRY Akademiia nauk SSSR.
Doklady of the Academy of Sciences of the U.S.S.R.
Earth science sections. v.124-
Jan./Feb. 1959- Washington

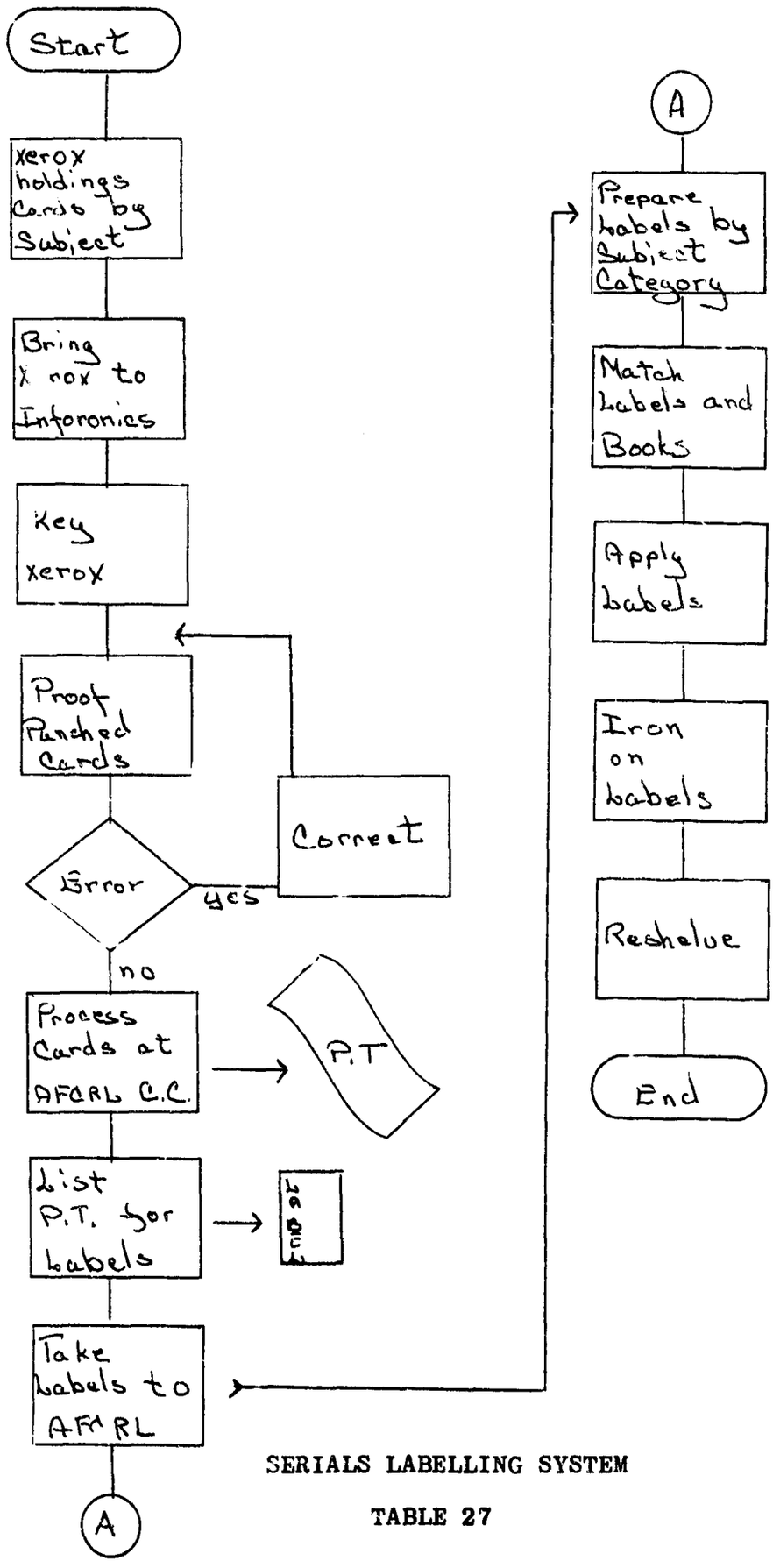
PUBR:

Russian VOL.	DATE	DATE	ACCOUNTABILITY	Russian VOL.	DATE	DATE	ACCOUNTABILITY
124	1-6	1959	F69-0259	134	1-6	1961	F69-02969
125	1-6	1960	F69-02960	135	1-6	1961	F69-02970
126	1-6	1959	F69-02961	136		1962bd	D65-128
127	1-6	1960	F69-02962	137		1962"	D65-128
128	1-6	1960	F69-02963	138		1962"	D65-128
129	1-6	1960	F69-02964	139	(1961)	1963"	20 May 66
130	1-6	1961	F69-02965	140	(1961)	1963"	D65-403 20 May 66c.2
131	1-6	1961	F69-02966	141	(1961)	1963"	D65-403 20 May 66c.2
132	1-6	1961	F69-02967				
133	1-6	1961	F69-02968				

LIBRARY COLLATION CARD

HOLDINGS SHEET

TABLE 26



SERIALS LABELLING SYSTEM

TABLE 27

Field 3 - Column 36-60 - book number

Field 4 - Column 75-80 - six digit control number

In this way, fields 1, 2, and 4 were automatically repeated. In the converted paper tape, field 4 data was always omitted.

All of the actual end processing was completed "on site" in the stacks. The holdings sheets (see Table 26) were the key to matching books and labels. There were many problems but most of these were of a minor nature. The most frequent problem was the one of missing books or labels, usually due to any one of five reasons:

1. In some instances, titles were missing from the inventory list.
2. Xerox records were not present for items on the inventory list.
3. Several items had never been cataloged.
4. Records had been overlooked in the keypunching process.
5. Keypunched records were not processed at the AFCRL Computer Center.

In each category there were a number of erroneous labels, usually due to either an error on the keypunchers part, or poor manuscript or bad data. In each catagory, as the initial labelling was completed, an error listing (Table 28) was compiled by the AFCRL staff. From here on the total cycle was repeated.

Papers in meteorology and geophics 498001

*ǂQCǂ851ǂp145

ǂV.1-2
ǂV.3-5
ǂV.6
ǂV.7
ǂV.8
ǂV.9

498100

Papers in physical oceanography and meteorology

*ǂQCǂ851ǂp15

ǂV.2
ǂV.3
ǂV.4
ǂV.5
ǂV.6
ǂV.7
ǂV.8
ǂV.9
ǂV.9ǂC.2
ǂV.10
ǂV.10ǂNO.1
ǂV.11
ǂV.11ǂC.2
ǂV.12.

ERROR LISTING

TABLE 28

All of the labels were produced on a modified Dura Mach 10 flexowriter, fitted with a standard Selin labelling device and an Orator typing sphere. Production runs averaged 2,000 labels. Labels were trimmed, using a label chopper that was specially designed at Inforonics, Inc. The 1,100 volumes in the "rare books" category were moved to a separate location where they were fitted with mylar jackets and then labelled.

After the labelling had been completed, the punched cards were sorted by class number at the AFCRL computer center. This classed listing was then used to facilitate the relocation and the actual reshelving of the entire collection. The project, which began in April, 1969 was essentially completed in September, 1969.

6. CONCLUSION

This system and the accomplishments described in this report fulfill the requirements of the contract as specified in the contract work statement*, item 1, sub items 1 AA, 1 AB, 1 AC, and 1 AD(6).

The system provides the basis for development of a totally automated library system. At present, data is entered into the system at the time of cataloging. If this system is to be developed further, then it is in this area that the next emphasis should be placed. Coordination of acquisitions within this system could not only help improve the current acquisitions procedures, but could be expected to decrease the cataloging load significantly.

Beyond this, authority lists, book form lists, etc. plus an SDI system should be developed.

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* See Appendix

7. BIBLIOGRAPHY

1. Curran, Ann T. and Donald J. MacDonald. Studies On The Air Force Cambridge Research Library Bibliographic Processing System. Final Report. Contract No. F-19650-67C-0318. Cambridge, Mass., Inforonics, Inc., July 15, 1968. 11 p.

2. MacDonald, Donal' J. Preliminary Program Specifications. Interim Report. Contract No. F-19650-67C-0318. Cambridge. Mass., Inforonics, Inc. February 15, 1968. 26 p.

3. Library of Congress Information Systems Office. MARC Manuals. Chicago, Information Science and Automation Division, American Library Association, 1969. 4 vols. in 1.

4. Talbot, Richard J. Letter dated, June 7, 1968.

APPENDICES

February 14, 1969

APPENDIX A

MARC II SET UP TABLE
TOTALLY KEYED RECORDS

NAME	FREQ	FUNC NO	INPUT TAG	INF. II ITEM NO.	Del. Type	Occur. Type	Ff. Pos.	CLPP Processing Treat.	CLPP Processing Func.	Out Tags	Cds	Sel	Lab	LC II TAG	LC II IND
Location-Copy-Vol.Statement	1	7	loc	013100	R	R		Take	4,5,6,7	013000	,a	b-c	b-c	059	*
Control No.	1	1[1-16]	crd	000100		U		Take	8	000100	x			001	
No.							0-10								
Supplement No.							11								
Suffix							12+								
Sub Record Directory	3	5	srd	000200		R		Omit		-				002	
Sub Record Relationships	3	5	srr	000300		R		Omit		-				003	

LC Tag Equivalent
Occurrence Types:

R = Repeatable (also not required)
U = Unique
* = Item must be present ("required")

*{ = One and only one of group must be present

{ = No more than one of group can be present

February 14, 1969

NAME	FREQ.	FUNC NO.	INPUT TAG	INF. II ITEM NO.	Init. Fill (b)	Occur. Type	FF, Pos.	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel.	Lab.	LC II TAG	LC II IND.
Variable Fixed Fields	1	5	ffd	001000		U*			8a	-				008	
Date Entered on File		17			b		0- 5	Omit		-					
Type Publication Date(s,c,n,r,m,q)		13 14a	ffd#3		*	*	6	Omit		-					
Date 1 (Numeric year)		13	#4		b		7-10	Take	8a	001000	x				
Date 2 (Numeric year)		13 14a	#5		b		11-14	Omit		-					
Country Pubn.Code(Alpha,left,just)		13	#6		b	*	15-17	Omit		-					
Illustration Codes(Alpha,left,just)		8	-		b		18-21	Omit		-					
Intellectual Level (j)		13	#8		b		22	Omit		-					
Form Reproduction Code (a-j)		13	#9		b		23	Omit		-					
Form Content(Alpha,left,just)		13	#10		b		24-27	Omit		-					
Government Pubn.Ind.(Not used)		13	#11		b		28	Omit		-					
Conference Indicator (x→1)[a]		13	#12		b		29	Omit		-					
Festschrift (x→1)[a]		13	#13		b		30	Omit		-					
Index (x→1)[a]		13	#14		b		31	Omit		-					
Main Entry in Body Ind.(x→1)[a]		13	#1		b		32	Omit		-					
Fiction Indicator (x→1)[a]		13	#15		b		33	Omit		-					
Biography Indicator (a-c)		13	#16		b		34	Omit		-					
Language		12			b	*	35-37	Omit		-					
Modified Record Indicator (x→1)[a]		13	#18		b		38	Omit		-					
Cataloging Source Code (a-c)			#21		b		39	Omit		-					
Status			-		n		40	Omit		-					
Legend - Type of Record (a)		13	#7		a		41	Omit		-					
Legend - Bibliographic Level (Alpha)		13	#17		b	*	42	Omit		-					
Legend - Blanks (extn.)			-		b		43-44	Omit		-					
Indicator Count			-		2		45	Omit		-					
Subfield Code Count			-		2		46	Omit		-					

* = Item must be present
a = Input as "x," converted to "1" on output
b = Initial fill means the code to be output if the block is not keyed, and the code to fill with if less than maximum number of characters.

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR. TYPE	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel	Lab.	LC II TAG	LC II IND.	
Systems No.	1	1.18	sys	001102	A	U*	Take	9	d	x			009		
LC Card No. (Outside Data)	3			002000	A	U	Omit		-				010		
National Bibliographic No.	3		nbn	002500	A	R	Omit		-				015		
Standard Book No.	2		sbn	004000	A	R	Take		240000	x			020		
Overseas Acquisition No.	3		pln	004500	A	U	Omit		-				025		
Local System No. (Outside Data)	3		-	006500	A	U	Omit		-				035		
Accountability No.	1		act	007100	A	R	Take		007100	x			039	*	
Cataloging Source	3		cat	010000	A	U	Omit		-				040		
Languages--Multi	1	12	lan	010100	B	U *	Omit		-				041	0	
Language--Translation	3	12	lanx	010110	B	U	Omit		-				041	1	
Search Code	3		sco	010200	A	U	Omit		-				042		
LC Call No. in LC	1		cal	012000	C	U *	Take	10,11	(a)(b)(c)	x_{abc}	*(a)	*(a)	050	0	
LC Call No. Not in LC	3		calx	012010	C	U	Take	12	(b)(c)	x_{bc}			050	1	
Copy Statement, in LC	3	5	cop	012100	D	U	Take		240000	x			051	0	
Copy Statement, not in LC	3	5	copx	012110	D	U	Omit		-				051	1	
NLM Call No.	3		nlm	014000	C	U	Omit		-				060		
NAL Call No.	3		nal	016000	C	U	Omit		-				070		
NAL Sub. Catalog No.	3		asc	016100	A	U	Omit		-				071		
UDC No.	3		udc	020000	A	U	Omit		-				080		
BNB Class No.	3		bnb	020100	A	U	Omit		-				081		
DDC No.	1		ddc	020200	A	U	Take	13	020200	x			082		
Supt. of Docs. Classif.	3		gpo	020600	A	U	Omit		-				086		
Local Call No. (Outside Data)	3		-	022000	E	U	Omit		-				090		

* LC Tag Equivalent

(a) = 012100 is split call no.
(b) = 012000 is call no. string.
(c) = 240000 is alternate class no.
(d) = 007000 is systems no.
000100 is LC card no. equivalent

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	CLPP Processing Func.	Out Tags	Cds.	Sel	Lab.	LC II TAG	LC II IND.	
ME, Personal, Forename	2		mepf	040000	F	U	Take		040000	x		x	100	0	0
ME, Personal, Single Surname	1		meps	040010	F	U	Take		040000	x		x	100	1	0
ME, Personal, Multiple	2		mepm	040020	F	U	Take		040000	x		x	100	2	0
ME, Personal, Name of Family	3		mepn	040030	F	U	Take		040000	x		x	100	3	0
ME, Personal, Forename is Subject	3	15	(mepf)	040001	F	U	Take	14	040000	x		x	100	0	1
ME, Personal, Single Surname is Subj.	3	15	(meps)	040011	F	U	Take	14	040000	x		x	100	1	1
ME, Personal, Multiple Surname is Subj	3	15	(mepm)	040021	F	U	Take	14	040000	x		x	100	2	1
ME, Personal, Name of Family is Subj.	3	15	(mepn)	040031	F	U	Take	14	040000	x		x	100	3	1
ME, Corporate, Surname	3		mecs	042000	G	U	Take		040000	x		x	110	0	0
ME, Corporate, Place	2		mecp	042010	G	U	Take		040000	x		x	110	1	0
ME, Corporate, Name	1		mecn	042020	G	U (a)	Take		040000	x		x	110	2	0
ME, Corporate, Surname is Subject	3	15	(mecs)	042001	G	U	Take	14	040000	x		x	110	0	1
ME, Corporate, Place is Subject	3	15	(mecp)	042011	G	U	Take	14	040000	x		x	110	1	1
ME, Corporate, Name is Subject	3	15	(mecn)	042021	G	U	Take	14	040000	x		x	110	2	1
ME, Conference, Surname	3		mems	042100	H	U	Take		040000	x		x	111	0	0
ME, Conference, Place	3		memp	042110	H	U	Take		040000	x		x	111	1	0
ME, Conference, Name	2		memn	042120	H	U	Take		040000	x		x	111	2	0
ME, Conference, Surname is Subject	3	15	(mems)	042101	H	U	Take	14	040000	x		x	111	0	1
ME, Conference, Place is Subject	3	15	(memp)	042111	H	U	Take	14	040000	x		x	111	1	1
ME, Conference, Name is Subject	3	15	(memn)	042121	H	U	Take	14	040000	x		x	111	2	1
ME, Uniform Title	2		(meu)	046000	I	U	Take		040000	x		x	130		0
ME, Uniform Title is Subject	3	15	meu	046001	I	U	Take		040000	x		x	130		1

(a) See Function No. 12a for exception.

February 14, 1969

NAME	FREQ.	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel	Lab.	LC II TAG	IND.	
Uniform, Title, Not on LC Cards	3		utin	110000	A	U	Take	15	110000	x			240	0	
Uniform, Title, On LC Cards	3		utia	110010	A	U	Take	15	110000	x			240	1	
Romanized, Title, No AE	3		romn	110100	A	U	Omit		-				241	0	
Romanized, Title, Make AE	3		roma	110110	A	U	Omit		-				241	1	
Title, Translated	3		tra	110200	A	U	Omit		-				242		
Title, Statement, No AE	2	12a	tiln	110500	J	U *	Take		110500	x		x	245	0	
Title, Statement, Make AE	1		tila	110510	J	U	Take	16	110500	x		x	245	1	
Edition	1		edn	112000	K	U	Take		112000	x			250		
Imprint	1	5	imp	114000	L	U *	Take		114000	x			260	0	
Imprint, Publisher in ME	3	14,5	(imp)	114010	L	U	Take		114000	x			260	1	
Collation	1	8	col	140000	M	U *	Take	17	140000	x			300		
Price Bibliographic	2		pri	152000	A	U	Omit		-				350		
Price Converted	3		cpr	154000	A	U	Omit		-				360		
Series, Personal, Forename	3		sepf	200000	F+N	R	Take	18,19	200000	x			400	0	0
Series, Personal, Surname	3		seps	200010	F+N	R	Take	18,19	200000	x			400	1	0
Series, Personal, Multiple, Surname	3		sepm	200020	F+N	R	Take	18,19	200000	x			400	2	0
Series, Personal Name of Family	3		sepn	200030	F+N	R	Take	18,19	200000	x			400	3	0
Series, Personal Forename in ME	3	9	(sepf)	200001	F+N	R	Take	18,19,20	200000	x			400	0	1
Series, Personal Single Surname in ME	3	9	(seps)	200011	F+N	R	Take	18,19,20	200000	x			400	1	1
Series, Personal, Multiple in ME	3	9	(sepm)	200021	F+N	R	Take	18,19,20	200000	x			400	2	1
Series, Personal, Name of Family in ME	3	9	(sepn)	200031	F+N	R	Take	18,19,20	200000	x			400	3	1
Series, Corporate, Surname	3		secs	202000	G+N	R	Take	18,19	200000	x			410	0	0
Series, Corporate, Place	2		secp	202010	G+N	R	Take	18,19	200000	x			410	1	0
Series, Corporate, Name	1		secn	202020	G+N	R	Take	18,19	200000	x			410	2	0

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	CLPP Processing Func.	Out Tags	Cds.	Sel	Lab.	LC TAG	LC IND.	
Series, Corporate, Surname in ME	3	9	(secs)	202001	G+N	R	Take	181920	200000	x			410	0	1
Series, Corporate, Place in ME	3	9	(secp)	202011	G+N	R	Take	181920	200000	x			410	1	1
Series, Corporate, Name in ME	3	9	(secn)	202021	G+N	R	Take	181920	200000	x			410	2	1
Series, Conference, Surname	3		sems	202100	H+N	R	Take	1819	200000	x			411	0	0
Series, Conference, Place	3		semp	202110	H+N	R	Take	1819	200000	x			411	1	0
Series, Conference, Name	2		semn	202120	H+N	R	Take	1819	200000	x			411	2	0
Series, Conference Surname in ME	3	9	(sems)	202101	H+N	R	Take	181920	200000	x			411	0	1
Series, Conference Place in ME	3	9	(semp)	202111	H+N	R	Take	181920	200000	x			411	1	1
Series, Conference Name in ME	3	9	(semn)	202121	H+N	R	Take	181920	200000	x			411	2	1
Series, Title	1		set	210000	O	R	Take	1819	200000	x			440		
Series, Not Traced	1		sen	222000	A	R	Take	18	200000	x			490	0	
Series, Traced Differently	2		sed	222010	A	R	Take	18	200000	x			490	1	
Notes, General	1		gen	240000	A	R	Take		240000	x			500		
Notes, Bound with	3		bnd	240100	A	U	Take		240000	x			501		
Notes, Dissertation	3		dis	240200	A	U	Take		240000	x			502		
Notes, Bibliographic	1		bib	240400	A	R	Take		240000	x			504		
Notes, Content	2		conc	240500	A	U	Take	21	240000	x			505	0	
Notes, Content (Incomplete)	3		coni	240510	A	U	Take	21	240000	x			505	1	
Notes, Partial, Contents	3		conp	240520	A	U	Take	22	240000	x			505	2	
Notes, Non Bibliographic (Marking)	2		mar	243000	A	R	Take	23	243000	x			518	*	
Notes, Non Bibl.(Lib.Lacks-Holdings)	2		lac	243100	A	R	Take		240000	x			519	*	
Notes, Abstract	3		ann	244000	A	U	Omit		240000	x			520		
Sub AE, Personal, Forename	3	10	supf	300000	F+P	R	Take	24,25	(a)	x			600	0	0
Sub AE, Personal, Single Surname	1	10	sups	300010	F+P	R	Take	24,25	(a)	x			600	1	0
Sub AE, Personal, Multiple Surname	3	10	supm	300020	F+P	R	Take	24,25	(a)	x			600	2	0
Sub AE, Personal, Name of Family	3	10	supn	300030	F+P	R	Take	24,25	(a)	x			600	3	0

* LC Tag Equivalent

(a) = 310000 is overprint heading;
300000 is tracing.

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	Func.	Out Tags	Gds.	Sel.	Lab	LC II TAG	IND.	
Sub AE, Personal, Forename, AC	3	10	supfc	300001	F+P	R	Take	24,25	(a)	x			600	0	1
Sub AE, Personal, Single SurnameAC	3	10	supsc	300011	F+P	R	Take	24,25	(a)	x			600	1	1
Sub AE, Personal, Multiple SurnameAC	3	10	supmc	300021	F+P	R	Take	24,25	(a)	x			600	2	1
Sub AE, Personal, Name of FamilyAC	3	10	supnc	300031	F+P	R	Take	24,25	(a)	x			600	3	1
Sub AE, Personal, Forename, NLM	3	10	supfm	300002	F+P	R	Omit		-				600	0	2
Sub AE, Personal, Single SurnameNLM	3	10	supsm	300012	F+P	R	Omit		-				600	1	2
Sub AE, Personal Multiple SurnameNLM	3	10	supmm	300022	F+P	R	Omit		-				600	2	2
Sub AE, Personal Name of Family, NLM	3	10	supnm	300032	F+P	R	Omit		-				600	3	2
Sub AE, Personal, Forename, NAL	3	10	supfa	300003	F+P	R	Omit		-				600	0	3
Sub AE, Personal, SingleSurnameNAL	3	10	supsa	300013	F+P	R	Omit		-				600	1	3
Sub AE, Personal, MultipleSurnameNAL	3	10	supma	300023	F+P	R	Omit		-				600	2	3
Sub AE, Personal, Name of FamilyNAL	3	10	supna	300033	F+P	R	Omit		-				600	3	3
Sub AE, Corporate, Surname	3	10	sucs	302000	G+P	R	Take	24,25	-				610	0	0
Sub AE, Corporate, Place	2	10	sucp	302010	G+P	R	Take	24,25	(a)	x			610	1	0
Sub AE, Corporate, Name	1	10	sucn	302020	G+P	R	Take	24,25	(a)	x			610	2	0
Sub AE, Corporate, Surname, AC	3	10	sucsc	302001	G+P	R	Take	24,25	(a)	x			610	0	1
Sub AE, Corporate, Surname, AC	3	10	sucpc	302011	G+P	R	Take	24,25	(a)	x			610	1	1
Sub AE, Corporate, Surname, AC	3	10	sucnc	302021	G+P	R	Take	24,25	(a)	x			610	2	1
Sub AE, Corporate, Surname, NLM	3	10	sucsm	302002	G+P	R	Omit		-				610	0	2
Sub AE, Corporate Surname, NLM	3	10	sucpm	302012	G+P	R	Omit		-				610	1	2
Sub AE, Corporate, Surname, NLM	3	10	sucnm	302022	G+P	R	Omit		-				610	2	2
Sub AE, Corporate, Surname, NAL	3	10	sucsa	302003	G+P	R	Omit		-				610	0	3
Sub AE, Corporate, Place, NAL	3	10	sucpa	302013	G+P	R	Omit		-				610	1	3
Sub AE, Corporate, Name, NAL	3	10	sucna	302023	G+P	R	Omit		-				610	2	3

(a) = 310000 is overprint heading;
300000 is tracing

February 14, 1969

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel	Lab	LC II TAG	IND.	
Sub AE, Conference, Surname	3	10	sums	302100	H+P	R	Take	24,25	(a)	x			611	0	0
Sub AE, Conference, Place	3	10	sump	302110	H+P	R	Take	24,25	(a)	x			611	1	0
Sub AE, Conference, Name	2	10	sumn	302120	H+P	R	Take	24,25	(a)	x			611	2	0
Sub AE, Conference, Surname, AC	3	10	sumsc	302101	H+P	R	Take	24,25	(a)	x			611	0	1
Sub AE, Conference, Place, AC	3	10	sumpc	302111	H+P	R	Take	24,25	(a)	x			611	1	1
Sub AE, Conference, Name, AC	3	10	sumnc	302121	H+P	R	Take	24,25	(a)	x			611	2	1
Sub AE, Conference, Surname, NLM	3	10	sumsn	302102	H+P	R	Omit		-				611	0	2
Sub AE, Conference, Place, NLM	3	10	sumpn	302112	H+P	R	Omit		-				611	1	2
Sub AE, Conference, Name, NLM	3	10	sumnn	302122	H+P	R	Omit		-				611	2	2
Sub AE, Conference, Surname, NAL	3	10	sumsa	302103	H+P	R	Omit		-				611	0	3
Sub AE, Conference, Place, NAL	3	10	sumpa	302113	H+P	R	Omit		-				611	1	3
Sub AE, Conference, Name, NAL	3	10	sumna	302123	H+P	R	Omit		-				611	2	3
Sub AE, Uniform, Title	2	10	suu	306000	I+P	R	Take	24,25	(a)	x			630		0
Sub AE, Uniform Title, AC	3	10	suuc	306001	I+P	R	Take	24,25	(a)	x			630		1
Sub AE, Uniform Title, NLM	3	10	suun	306002	I+P	R	Omit		-				630		2
Sub AE, Uniform Title, NAL	3	10	suua	306003	I+P	R	Omit		-				630		3
Sub AE, Topical	1	10	sut	312000	A+P	R	Take	24,25	(a)	x			650		0
Sub AE, Topical, AC	3	10	sutc	312001	A+P	R	Take	24,25	(a)	x			650		1
Sub AE, Topical, NLM	3	10	sutn	312002	A+P	R	Omit		-				650		2
Sub AE, Topical, NAL	3	10	suta	312003	A+P	R	Omit		-				650		3
Sub AE, Topical, Place	2	10	sutp	312010	A+P	R	Take	24,25	(a)	x			650	1	0
Sub AE, Topical, Place, AC	3	10	sutpc	312011	A+P	R	Take	24,25	(a)	x			650	1	1
Sub AE, Topical, Place, NLM	3	10	sutpn	312012	A+P	R	Omit		-				650	1	2
Sub AE, Topical, Place, NAL	3	10	sutpa	312013	A+P	R	Omit		-				650	1	3
Sub AE, Geographic Name	1	10	sug	312100	A+P	R	Take	24,25	(a)	x			651		0
Sub AE, Geographic Name, AC	3	10	sugc	312101	A+P	R	Take	24,25	(a)	x			651		1
Sub AE, Geographic Name, NLM	3	10	sugn	312102	A+P	R	Omit		-				651		2
Sub AE, Geographic Name, NAL	3	10	suga	312103	A+P	R	Omit		-				651		3
Sub AE, Geographic Name, Place	2	10	sugp	312110	A+P	R	Take	24,25	(a)	x			651	1	0
Sub AE, Geographic Name, Place, AC	3	10	sugpc	312111	A+P	R	Take	24,25	(a)	x			651	1	0
Sub AE, Geographic Name, Place, NLM	3	10	sugpn	312112	A+P	R	Omit		-				651	1	2
Sub AE, Geographic Name, Place, NAL	3	10	sugpa	312113	A+P	R	Omit		-				651	1	3
Sub AE, Political Jurisdiction	1	10	sui	312200	A+P	R	Take	24,25	(a)	x			652		0

NAME	FREQ.	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel	Lab.	LC II TAG	IND.	
Local Subject Heading Systems	3	10	--	322000	A+P	R	Omit		1				690		
AE, Personal, Forenames,Alternative	3		aepfa	340000	F+Q	R	Take	26,27	(a)	x			700	0	0
AE,Personal, Single,Surname,Alt.	1		aepsa	340010	F+Q	R	Take	26,27	(a)	x			700	1	0
AE, Pesonal,Multiple,S rname,Alt.	3		aepma	340020	F+Q	R	Take	26,27	(a)	x			700	2	0
AE, Personal,Name of Family,Alt.	3		aepna	340030	F+Q	R	Take	26,27	(a)	x			700	3	0
AE, Personal, Forename, 2d	3		aepfs	340001	F+Q	R	Take	26,27	(a)	x			700	0	1
AE, Personal, Single,Surname, 2d	1		aepss	340011	F+Q	R	Take	26,27	(a)	x			700	1	1
AE, Personal, Multiple,Surname,2d	3		aepms	340021	F+Q	R	Take	26,27	(a)	x			700	2	1
AE, Personal, Name of Family, 2d	3		aepns	340031	F+Q	R	Take	26,27	(a)	x			700	3	1
AE, Personal, Forename, Analysis	3		aepfn	340002	F+Q	R	Take	26,27	(a)	x			700	0	2
AE, Personal, Single Surname, Anal.	2		aepsn	340012	F+Q	R	Take	26,27	(a)	x			700	1	2
AE, Personal, Multiple,Surname,Anal	3		aepmn	340022	F+Q	R	Take	26,27	(a)	x			700	2	2
AE, Personal, Name of Family,Anal.	3		aepnn	340032	F+Q	R	Take	26,27	(a)	x			700	3	2
AE, Corporate,Surname,Alternative	3		aecsa	342000	G+Q	R	Take	26,27	(a)	x			710	0	0
AE, Corporate, Place,Alternative	3		aecpa	342010	G+Q	R	Take	26,27	(a)	x			710	1	0
AE, Corporate, Name, Alternative	2		aecna	342020	G+Q	R	Take	26,27	(a)	x			710	2	0
AE, Corporate, Surname, 2d	3		aecss	342001	G+Q	R	Take	26,27	(a)	x			710	0	1

(a) = 310000 is overprint heading;
300000 is tracing

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel	Lab	LC II TAG	IND.	
AE, Corporate, Place, 2d	2		aecps	342011	G+Q	R	Take	26,27	(a)	x			710	1	1
AE, Corporate, Name, 2d	1		aecns	342021	G+Q	R	Take	26,27	(a)	x			710	2	1
AE, Corporate, Surname, Analysis	3		aecsn	342002	G+Q	R	Take	26,27	(a)	x			710	0	2
AE, Corporate, Place, Analysis	3		aecpn	342012	G+Q	R	Take	26,27	(a)	x			710	1	2
AE, Corporate, Name, Analysis	3		aecnn	342022	G+Q	R	Take	26,27	(a)	x			710	2	2
AE, Conference, Surname, Alternative	3		aemsa	342100	H+Q	R	Take	26,27	(a)	x			711	0	0
AE, Conference, Place Alternative	3		aempa	342110	H+Q	R	Take	26,27	(a)	x			711	1	0
AE, Conference, Name, Alternative	2		aemna	342120	H+Q	R	Take	26,27	(a)	x			711	2	0
AE, Conference, Surname, 2d	3		aemsn	342101	H+Q	R	Take	26,27	(a)	x			711	0	1
AE, Conference, Place, 2d	3		aemps	342111	H+Q	R	Take	26,27	(a)	x			711	1	1
AE, Conference, Name, 2d	2		aemns	342121	H+Q	R	Take	26,27	(a)	x			711	2	1
AE, Conference, Surname, Analysis	3		aemsn	342102	H+Q	R	Take	26,27	(a)	x			711	0	2
AE, Conference, Place, Analysis	3		aempn	342112	H+Q	R	Take	26,27	(a)	x			711	1	2
AE, Conference, Name, Analysis	3		aemnn	342122	H+Q	R	Take	26,27	(a)	x			711	2	2
AE, Uniform, Alternative	3		aeum	346000	I+Q	R	Take	26,27	(a)	x			730		0
AE, Uniform, 2d	3		aeus	346001	I+Q	R	Take	26,27	(a)	x			730		1
AE, Uniform, Analysis	3		aeun	346002	I+Q	R	Take	26,27	(a)	x			730		2
AE, Title Traced Differently	2		aeds	350000	A	R	Take	262728	(a)	x			740		

(a) = 310000 is overprint heading;
300000 is tracing.

NAME	FREQ	FUNC. NO.	INPUT TAG	INF. II ITEM NO.	DEL. TYPE	OCCUR TYPE	CLPP Processing Treat.	Func.	Out Tags	Cds.	Sel	Lab	LC II TAG	IND.	
AE, Non-Author, Alternative	3		aena	352000	A	R	Take	26,27	(a)	x			750	0	0
AE, Non-Author, Place,Alternative	3		aenpa	352010	A	R	Take	26,27	(a)	x			750	1	0
AE, Series, Personal,Forename	3		aepf	400000	F+N	R	Take	27,29	(b)	x			800	0	
AE, Series, Personal,Single Surname	3		aeps	400010	F+N	R	Take	27,29	(b)	x			800	1	
AE, Series,Personal,Multiple Surname	3		aepm	400020	F+N	R	Take	27,29	(b)	x			800	2	
AE, Series,Personal,Name of Family	3		aepn	400030	F+N	R	Take	27,29	(b)	x			800	3	
AE, Series, Corporate,Surname	3		aecs	402000	C+N	R	Take	27,29	(b)	x			810	0	
AE, Series, Corporate,Place	2		aecp	402010	C+N	R	Take	27,29	(b)	x			810	1	
AE, Series, Corporate,Name	1		aecn	402020	C+N	R	Take	27,29	(b)	x			810	2	
AE, Series, Conference, Surname	3		aems	402100	H+N	R	Take	27,29	(b)	x			811	0	
AE, Series, Conference, Place	3		aemp	402110	H+N	R	Take	27,29	(b)	x			811	1	
AE, Series, Conference, Name	3		aemn	402120	H+N	R	Take	27,29	(b)	x			811	2	
AE, Series, Title	2		aet	410000	0	R	Take	27,29	(b)	x			840		

(a) = 310000 is overprint heading; 300000 is tracing.

(b) = 410000 is overprint heading; 400000 is tracing.

OCTAL INDEX GROUP BY INPUT TYPE

Numbers in ( ) are the programs index used by the "TABDEL" table.
NONE(ØØ)

DELIMITED SUBFIELDS

*Type A (27)-Repeatable •a

•a	Data element of field

Type B (Ø4)

•a	Language Codes
•b	Summary Codes

*Type C (26)

•a	Class Number - repeatable •a
•b	Book Number

Type D (Ø3)

•a	Class Number
•b	Book Number
•c	Copy Information

Type E (Ø3)

•a	Call Number
•b	Holding Collection Code
•c	No. of Copies

Type F (Ø2)-combines

•a	Name
•b	Numeration
•c	Titles
•d	Dates
•e	Relator
•k	Form Subheadings
•t	Title (of book)

Type G (2Ø)-combines

•a	Name
•b	Subordinate Unit
•e	Relator
•k	Form Subheading
•t	Title (of book)

Type H (Ø1)-combines

•a	Name
•b	Number
•c	Place
•d	Date
•e	Subordinate Unit

●g	Other Misc. Information
●k	Form Subdivision
●t	Title (of book)

Type I (24)-combines

●t

Type J

●a	Short Title
●b	Remainder of Title
●c	Remainder of Title Page Transcription

Type K (Ø4)

●a	Edition
●b	Remainder of Edition Statement

*Type L (25)-repeatable ●a

●a	Place
●b	Publisher
●c	Date

Type M (Ø3)

●a	Pagination
●b	Illustration
●c	Height

Type N (1Ø)-combiner (never alone)

●v	Volume or Number

Type O (Ø4)-combiner

●a	Title
●b	Volume or Number

Type P (22)-combiner

●x	General Subdivision
●y	Period Subdivision
●z	Place Subdivision

Type Q (14)-combiner (never alone)

●u	Filing Information

Type R (ØØ)-generated; not valid input

●a	Location Symbols (repeatable)
●b	Copy Numbers
●c	Volume Numbers
●d	Suppress Cards Bit
	Suppress Selin Bit
	Suppress Book Labels Bit
	Number of Extra Main Entries

* - only groups which have input ●a extra.

MARC II TYPING INSTRUCTIONS

MARC II keyed on a batch basis. Each batch contains 25 records. In most instances there is one worksheet to a record - but there may be any number of worksheets to a record (in a multi-worksheet record, all worksheets will have a common systems number that will be keyed only once at the beginning of each record). MARC II can be typed on a Friden or Dura typewriter. Set to single space and set five tabs. Type a carriage return. All of the data is tagged on the worksheet. A delimiter may be indicated within data by a flag, ‡. On a Dura, [] △ is used to indicate this delimiter: On a Friden, use • (bullet). Do not type a space before or after a delimiter - the computer program will replace the delimiter with a space. Type hyphens as shown - except "end of line" hyphens. Use double hyphens instead of EM or EN dashes. Use capitalization as shown on the catalog card; on the rest of the worksheet use capitals only in "act. number," "loc. symbol," and "local call number."

1. The first item on a worksheet is the systems number ("sys")

sys	af69- 2367	no acc a	no mf m

This is to be typed.

sys ——— af69-2367am

In multiple worksheet records* the systems no. will appear on each worksheet - but it should only by typed once, as the first item on that record.

2. The next item is the accountability number ("act")

   It will be shown

   act | F68-01234 |

   Type as follows:

   act —┤ F68-01234

   There should be one act. no. for each record.

3. The next item is the cataloging source; this information may or may not be present. It will be shown:

   cat | afcrl |

   Type as follows:

   cat —┤ afcrl

   If no information is present, go on to next item.

4. The next item is location ("loc") and this information may be shown in a variety of forms.

   Type as shown, e.g.:

	Loc.Symbols	Copy No(s)	Vol.No.(s)	No Cd	No S	No Bk	xME
loc	1. RES	2.	3.	4. X	5.	6. X	7.
loc	1.	2. c.2	3.	4.	5.	6.	7.

   Type as follows:

   loc —┤1.RES —┤4.x —┤6.x
   loc —┤2.c.2

   If the item shows:

	Loc.Symbols	Copy No(s)	Vol.No.(s)	No Cd	No S	No Bk	xME
loc	1.	2. c.3-4	3. v.1-6	4.	5.	6.	7.
loc	1.Chem/Ref	2. c.5	3. v.6-7	4.	5.	6.	7.

Type as follows:

loc —| 2. | c.3-4 —| 3. | v.1-6
loc —| 1.Chem/Ref —| 2.c.5 —| 3.v.6-7

If no bar is shown (v.6-7) it means two volumes in one book.

*5. Local call number ("call") is next. If there is information here it will be shown:

call HG/276/D725

Type as follows:

call —| HG/276/D725 (Use caps as indicated.)

6. Next item is language ("lan"). It may be lan, lan[x], lan•b, or lan[x]•b. It will be shown:

lan[ ] eng

Type:

lan —| eng

It may be shown:

lan[X]•b engfre≠rusger

This should be typed:

lanx•b —| engfre•rusger

The next item on the worksheet is a catalog card which is usually stapled to the worksheet. Every catalog card contains a number of tagged variable fields. All of these should be typed: tag, tab, data. Data should be keyed as printed with the following exceptions:

a. Initials in the main entry* should be followed by a period, with one space between initials.

b. Brackets around a conventional title* are omitted.

c. Parentheses around a series note are omitted.

d. In contents note* the word "contents" "partial contents" plus the following EM dash are omitted.

e. Numbers before tracings* are omitted.

f. EM dashes within subject tracings are replaced by a bullet.

g. When a date occurs in a call number, only one space is left between it and the rest of call number.

The next item on the worksheet is "continuation worksheets?" This data is not to be typed. If there should be more than one worksheet for a record, the ffd is to be typed as it appears on the last worksheet. On a second worksheet, disregard any data written above the catalog card. The next item is fixed field data.

ffd

ME/Body	Pub/ME	Date Key	Date 1	Date 2	Country	Type
1. X	2.	3. 5	4. 1968	5.	6. NYU	7. A
Juv.	Repro.	Contents	Govt.Pub	Meet/C	Fest.	Index
8.	9.	10. d	11.	12.	13.	14.
Fict.	Biog.	Bio.Level	Mod.Rec.	Sub/ME	Suppl#	NAL/NLM
15.	16.	17. M	18.	19.	20.	21.

It is to by typed:

ffd —|1.x —|3.s —|4.1968 —|6.nyu
7.a —| 10.d —|17.m

*See appended catalog cards for location of these items.

The last item on a worksheet may be locally assigned tracings. These are written on the blank lines at the bottom of the worksheet as follows:

Tag	Data
aecnal	National Audubon Society

This is to be typed:

aecnal—| National Audobon Society.

To kill a line in the record, type at the end of that line

■kl.

To kill a record, type at the end of that record

■kr.

B-6 qf69-16a

	Lib.	Yr.	Mo.	Day	Seq. No.	No Acc.	No MF
sys	AFC	69	01	06	0010016		

act F68-00045 cat

	Loc. Symbols	Copy No.(s)	Vol.No.(s)	No Cds.	No Sel.	NoB Lab.	Ext. ME
loc	1.	2.	3.				
loc	Loc. Symbols 1.	Copy No.(s) 2.	Vol.No.(s) 3.	No Cds. 4.	No Sel. 5.	NoB Lab. 6.	Ext. ME 7.

call lan eng

mepw. d James, William, 1842-1910.
tea. c The writings of William James; a comprehensive edition. Edited, with an introd., by John J. McDermott. New York, Random House, 1967.
mp. bc
col. c li, 858 p. 25 cm.
bib "Annotated bibliography of the writings of William James [by R. B. Perry]": p. [811]-858.

0 sut. x Philosophy—Collected works. acpwa. e McDermott, John J., ed.

cal. is B945.J21M3 ddc 191 cra 67-11593 rev

~~Library of Congress~~ ~~[6885]~~

	ME in Body	Pub.is	Pub.Date	Date 1	Date 2	Country	Type
ffd	1. X	2. ME	3. Key	4. 1967	5.	6. XXX	7. X
	Juvenile 8.	Repro. Form 9.	Contents 10.	Govt. Pubn. 11.	Meet/ Conf. 12.	Fest-schrift 13.	Index 14.
	Fiction 15.	Biog. 16.	Bib. Level M 17.	Mod.Rec. 18.	Subj.is ME 19.	Suppl. No. 20.	NAL or NLM Cat. 21.

Tag Data

___ _____

___ _____

___ _____

___ _____

Continuation Worksheets? _____

[redacted]

sys	af69-16a
act	F68-00045
lan	eng
meps•d	James, William,•1842-1910.
tila•c	The writings of William James;•a comprehensive edition. Edited, with an introd., by John J. McDermott.
imp•bc	New York,•Random House•[1967]
col•c	li, 858 p.•25 cm.
bib	''Annotated bibliography of the writings of William James [by R. B. Perry]'': p. [811]-858.
sut•x	Philosophy•Collected works.
aepsa•e	McDermott, John J.,•ed.
cal•b	B945.J21•M3
ddc	191
crd	67-11593 rev
ffd	1.x 3.s 4.1967 6.ny 7.a 17.m

[redacted]

B-8

af 69-5a

	Lib.	Yr.	Mo.	Day	Seq. No.	No Acc.	No MF
sys	AFC	619	011	016	0101010105	X	

act F68-00034 cat

	Loc. Symbols	Copy No.(s)	Vol.No.(s)	No Cds.	No Sel.	NoB Lab.	Ext.
loc	1.	2.	3.	4.	5.	6.	ME 7.
loc	Loc. Symbols 1.	Copy No.(s) 2.	Vol.No.(s) 3.	No Cds. 4.	No Sel. 5.	NoB Lab. 6.	Ext. ME 7.

call lan Eng

mep
Zemlin, Willard R.
Tilas. c Speech and hearing science; anatomy and physiology / by Willard R. Zemlin. Englewood Cliffs, N. J., Prentice-Hall [1968]
imp. lc
col. lc viii, 589 p. illus. 24 cm.
bib Includes bibliographical references.

sut sut
1. Speech. 2. Hearing. 1. Title.
cal. lc QP306.Z4 612'.78 dde
Library of Congress 68-10101 rcd

	ME in Body	Pub.is	Pub.Date	Date 1	Date 2	Country	Type
ffd	1. X	2. ME	3. Key	4. 1968	5.	6. NYU	7. A
	Juvenile 8.	Repro. Form 9.	Contents 10.	Govt. Pubn. 11.	Meet/ Conf. 12.	Festschrift 13.	Index 14. X
	Fiction 15.	Biog. 16.	Bib. Level 17. M	Mod.Rec. 18.	Subj.is ME 19.	Suppl. No. 20.	NAL or NLM Cat. 21.

Tag Data

___ _____

___ _____

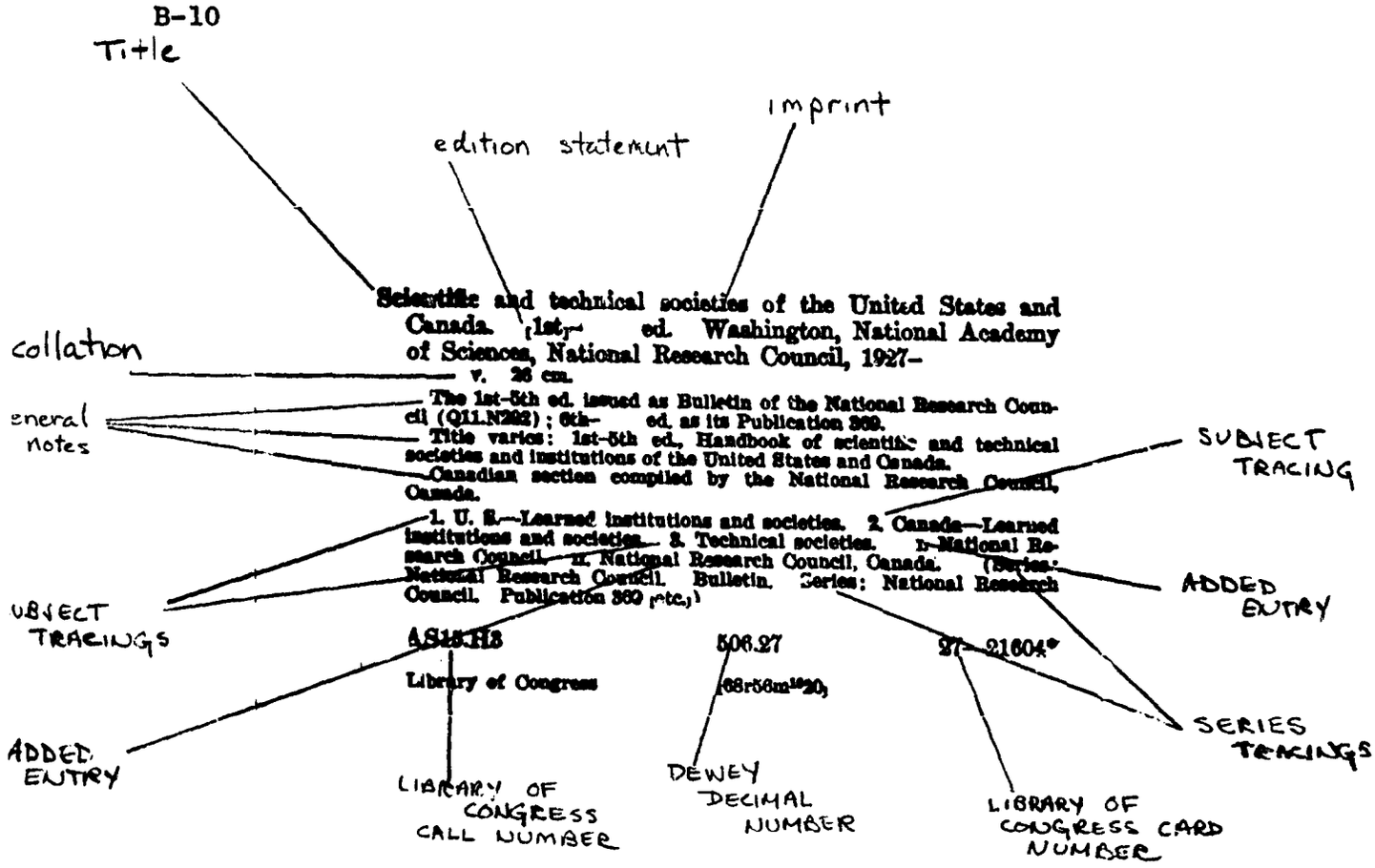
___ _____

___ _____

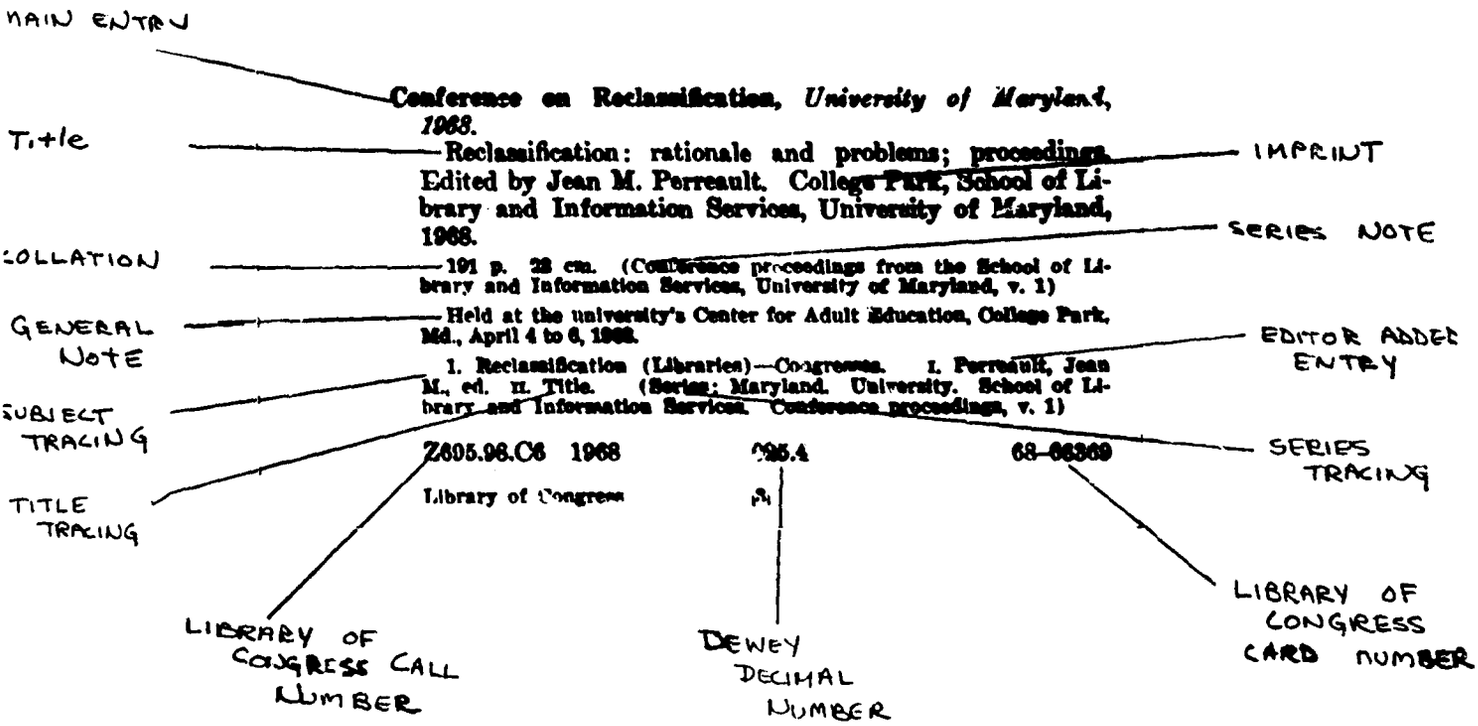
Continuation Worksheets? _____

4964

sys	af69-5a	
act	F68-00034	
lan	eng	
mep	Zemlin, Willard R.	
tila/•c	Speech and hearing science; anatomy and physiology•[by Willard R. Zemlin.	
imp•bc	Englewood Cliffs,•N.J.,•Prentice-Hall•[1968]	
col•bc	viii, 589 p.•illus.•24 cm.	
bib	Includes bibliographical references.	
sut	Speech.	
sut	Hearing.	
cal•b	QP306•.Z4	
ddc	612/.78	
crd	68-10101	
ffd	1.x 3.s 4.1968 6.mju 7.a 14.x 17.m	
[redacted]		



Scientific and technical societies of the United States and Canada. [1st]– ed. Washington, National Academy of Sciences, National Research Council, 1927–
v. 26 cm.
The 1st-5th ed. issued as Bulletin of the National Research Council (Q11.N282); 6th– ed. as its Publication 369.
Title varies: 1st-5th ed., Handbook of scientific and technical societies and institutions of the United States and Canada.
Canadian section compiled by the National Research Council, Canada.
1. U. S.—Learned institutions and societies. 2. Canada—Learned institutions and societies. 3. Technical societies. I. National Research Council. II. National Research Council, Canada. (Series: National Research Council. Bulletin. Series: National Research Council. Publication 369 etc.)
AS16.H3 506.27 27–21604*
Library of Congress 68r56m[1820]



Conference on Reclassification, *University of Maryland, 1968.*
Reclassification: rationale and problems; proceedings. Edited by Jean M. Perreault. College Park, School of Library and Information Services, University of Maryland, 1968.
191 p. 28 cm. (Conference proceedings from the School of Library and Information Services, University of Maryland, v. 1)
Held at the university's Center for Adult Education, College Park, Md., April 4 to 6, 1968.
1. Reclassification (Libraries)—Congresses. I. Perreault, Jean M., ed. II. Title. (Series: Maryland. University. School of Library and Information Services. Conference proceedings, v. 1)
Z695.96.C6 1968 025.4 68-66369
Library of Congress

(1)

sys	af69-	no acc	no mf

(2) act

(3) cat

(4)

	Loc.Symbols	Copy No(s)	Vol No(s)	No Cd	No S	No Bk	% ME
loc	1.	2.	3.	4.	5.	6.	7.
loc	1.	2.	3.	4.	5.	6.	7.

(5) call _____ ___ (6) lan ☐ _____

(7) Continuation Worksheets? _____ (If yes, fill in ffd, etc. on last sheet only.)

(8)

ffd	ME/Body	Pub/ME	Date Key	Date 1	Date 2	Country	Type
	1.	2.	3.	4.	5.	6.	7.
	Jun.	Repro.	Contents	Govt Pub.	Meet/C	Fest.	Index
	8.	9.	10.	11.	12.	13.	14.
	Fict.	Biog.	Bib.Level	Mod.Rec.	Sub/ME	Suppl.#	NAL/NLM
	15.	16.	17.	18.	19.	20.	21.

(9)

Tag	Data
___	_____
___	_____
___	_____

APPENDIX C

REJECT LISTING LAYOUT

ORDER

Records will be printed in order of:

1. Program that rejected the record
2. Library systems number

HEADER

Each individual reject record begins with three header lines that tell:

1. a. The program that rejected the record (i.e., MFG)
   b. The date when the computer run was made (YYMMDD)
   c. The message RJCT (rejected) or QUES (questioned). Rejected means the record did not go out on the Master File, Questioned means it did.
2. The systems number of the record.
3. The Library of Congress card number or equivalent from that record (If none, the Cataloging Source).

See Figure 1 for the sample page format. If the systems number were omitted when the record was keyed, the tag "SYS" will be replaced on the listing by "ID?." How do you find such a record? The listing is in systems number order. Use the third header line, the card number, to locate the bad record. It lies between the last and the next rejected records. If the card number were omitted, the tag "CRD" will say "CRD?".

APPENDIX C

Figure 1

```
#1

RQV-- 7ØØ9Ø8    REJT
ID?
CRD       78-Ø84318
ILLID?/44ØØ6

ILLTAG    44ØØ6
MISTAG/REQ

#2

RQV-- 7ØØ9Ø8    REJT
ID?
CRD       78-Ø86773
ILLID/REQ-24

ILLTAG    REQ-244Ø13
MISTAG/REQ

#3

RQV-- 7ØØ9Ø8    REJT
REQ    VT 7Ø
CRD       72-Ø75783
ILDATA/2 REQ   VT7Ø244Ø18

#4

RQV-- 7ØØ9Ø8    REJT
ID?
CRD?
ILLID?/CALL
MISTAG/CRD
MISTAG/REQ


#5

RQV-- 7ØØ9Ø8    REJT
ID?
CRD       78-Ø43293
ILLID/REQ-39

ILLTAG    REQ-349ØØ1
MISTAG/REQ
```

ERROR DEFINITIONS

Figure 2 is a summary table of error definitions used by the Master File Generator. It is important to remember that one error can generate multiple error messages. For example: the systems number tag is mispelled to say "SYT" instead of "SYS". This one error will generate the following error conditions:

```
MFG--              690512  REJT
ID?
CRD                68-014664
ILLID?/SYT
ILLTAG             SYT       AF 69-000123
MISTAG/SYS
```

NOTES:

1. The first tag in the record is not one of the two valid record I.D."s "SYS" or "RFQ".
2. The tag "SYT", itself, is never a legal tag.
3. The tag "SYS" is a required tag which is missing in this record.

APPENDIX C

Figure 2

MFG ERROR TYPES:

LEGEND USED: t's=any tag
d's=any subfield delimiter char.
c's=any data char. within the field
n's=any decimal number.

ILLID?/ttttt	The first tag in the record is not "SYS" or "REQ". The record type (SYS=totally keyed record systems number, REQ=request record systems number) cannot be identified. The second identification headline will say "ID?" ttttt=the error I.D. tag (the first tag of the record). Processing of the record (and this tag) continues, assuming that the record is the same type as the previous record.
ILLTAG	The following tag is illegal (i.e., it is not in the MFG's table of legal tags). The tag itself and all data in the field is printed following. Processing of the item is terminated (no further checking of item done).
ILLTAG/tttttL(or)E	The tag itself is legal, but the ending suffix character "L" (for "Local") or "E" (for "Eliminate") is illegal with the tag. Processing of the item continues.
ILLDEL/tttttd	The subfield delimiter "d" is illegal for tag "ttttt". Checking of the remaining subfield delimiters and processing of the item continues.
DUPTAG/ttttt	The tag "ttttt" is the duplicate of a previous individual tag encounter which should be unique (i.e., only one per record is allowed). Processing of the item continues.
DUPTAG/ttttt+	The "+" sign following the tag "ttttt" indicates there was a previous tag encountered which is in the same group as this tag and only one tag from the group is allowed per record. This check is performed at the end of the record and all duplicates within a group (except the first encountered) will be printed out separately as errors. Example: MEPS and MECP in same record (i.e., two main entries are illegal).

ILDATA/c	The character "c" is not allowed to be in this item's data field. The tag and complete data field is printed following: Processing of the item is terminated. (i.e., move on to next item immediately).
ILDATA/n/c	The character "c" is illegal data for block number "n" of a "LOC" or "FFD" field. The tag and complete data field follows. Processing of the item is terminated. (i.e., move on to next field, ignoring remaining blocks in this field).
MISDEL	Missing delimiter(s). There are more "bullets" in the data than there are subfield delimiters following the tag. The tag and complete data field is printed following. Processing of the item is terminated. NOTE: Count and check to see if more than one delimiter is missing.
MISBUL/d	Missing "bullet(s)". When the item was completely processed, there were subfield delimiters, starting at delimiter "d", which had no "bullets" in the data field to match them. The tag and complete data field are printed following. The field was completely processed. NOTE: Counting the delimiters remaining, starting at "d" tells you exactly how many "bullets" are missing.
ILLBLK/n	Illegal block number. The number "n" identifying an "FFD" or "LOC" subfield block is an illegal block number (e.g., "LOC" blocks are 1-7, "FFD" blocks are 1-21). The tag and complete data field follows. Processing of the field is terminated. (i.e., remaining blocks are not processed; goes onto next tag).
DUPBLK/n	Duplicate block number. There are two blocks in the "LOC" or "FFD" field which have the same block number and block numbers should be unique. The tag and complete data field is printed following. Processing of the field is terminated. (i.e., remaining blocks are not processed).

MISBLK/FFDn (or) MISBLK/LOCn	Missing block number. A "LOC" or "FFD" block "n" which is required is not present. This check is performed at the end of the complete field and all missing required blocks are checked and printed out separately. (required blocks are FFD 3, 6, and 17 presently).
MISREF/ttttt	Missing reference field "ttttt". The current tag being processed (which is printed with its data following) is supposed to "do something" to or with tag "ttttt" which is missing from this record. Processing of the field is terminated.
MISREF/n/ttt	Missing reference "LOC" or "FFD" block. Same as above, with "n" being the specific block number whose reference field is missing.
MISTAG/ttttt	Missing required tag "ttttt". This check is performed at the end of the record. All individual tags which are flagged as being required and were not present in this record are printed separately.
MISTAG/ttttt+	Missing group tag. Same as above, but the "+" sign indicates that there is a group of tags of which at least one is required per record but none were present in this record. NOTE: The tag "ttttt" which is printed is merely the last tag of that group in the MFG's table. It does not mean that specific tag is missing, but merely one in its group.
CHARCT/n	Character count error. The character count in "FFD" or "LOC" block number "n" is less or greater than the number of characters required. The tag and complete data field are printed following. Processing of the field is terminated (i.e., no further blocks are processed).
ILLPRE	Illegal prefix. The one to three character alpha library code prefix in the "SYS" or "REQ" tags or the alpha prefix portion of the L.C. card number (CRD is invalid. The tag and complete data field is printed following. Processing of the item is terminated.

ILLEND/NO?	The MFG got to the end of the physical input record without finding the proper end of record terminating sequence This should never occur
NODATA	A field has no data in it. The tag and complete data field are printed following. Processing of the field is terminated. (e.g., if a tag-tab was immediately followed by a carriage return and the next tag, .
NODATA/●	A subfield has no data in it. Happens if there are two sequential "bullets" in a data field. (See above)
MISDAT/c	Missing data. The character "c" which is required to be present in the field is missing (e.g., no period in a CAL number). The tag and complete data field is printed following. Processing of the item is terminated.
MISDAT/n/c	Same as above, except "n" specifies the particular subfield or block number which has the missing data.

The proofreader should note that in some of the error conditions described previously, the MFG "cuts out" on the error condition and does not process the remainder of the data (e.g., an error data character).

The general rule should be to continue to scan the data starting at the last error found by the MFG to make sure there are no additional errors from there to the end of the field.

APPENDIX D

To: R. Talbot

From: L. F. Buckland

Subject: Program Specification

Date: February 20, 1969

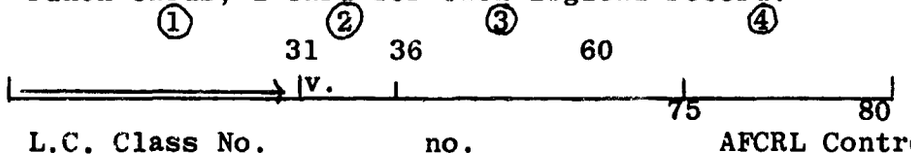
The following is a set of specifications for the card to tape conversion needed in the label production activity.

Objective

To convert IBM 026 Hollerith codes to a special arrangement of BCD paper tape codes.

Input

Punch cards, 1 card for each logical record.



Field 1, L.C. Class No (1-20) Data appears in col.1 to occurrence of three blanks or end of field.

Field 2, Volume abbreviation. Col. 31 to 36.

Field 3, Book No. (36-60) Data appears in col. 36 to occurrence of three blanks or end of field.

Field 4, AFCRL control no. 75-80.

Output

Punch tape of class no. and book no. portion of card.

Processing

1. a. Convert codes according to the attached table.

   b. Preceding a single number or string of numbers insert a lower case octal code 172.

   c. Preceding a single letter or string of letters insert an upper case octal code 174.

d. For Hollerith * code create output sequence of octal codes 174, 07.

e. For Hollerith / code create output sequence of octal codes 174,150.

2. Copy field 1, delete trailing blanks, insert an octal 200 code at end of fields.

3. Copy field 2.

4. Copy field 3, delete trailing blanks, insert a 200 code at end of fields.

5. Disregard field 4, insert 3 octal 200 codes and a 174 at end of card.

L.C. Call No. Conversion Table

Hollerith	Octal
1	01
2	02
3	23
4	10
5	04
6	26
7	25
8	07
9	37
ø	31
A	127
B	73
C	67
D	45
E	64
F	163
G	141
H	51
I	106
J	160
K	46
L	70
M	121
N	62
O	130
P	144
Q	166
R	105
S	111
T	75
U	43
V	103
W	133
X	61
Y	171
Z	40
,	147
.	122
SKIP	153
SPACE	20
%	200
□	174
@	172
*	sequence 174 then 07
/	sequence 174 then 150

APPENDIX E

Work Statement "A"

Purchase Request No. CRL-81144

Part I - STATEMENT OF WORK

A. The Contractor shall supply the necessary personnel, facilities, services and materials to accomplish the following:

Line Item 1 - Conduct investigations and perform required analysis and data encoding to develop routines, and techniques, for the conversion of AFCRL and/or Library of Congress supplied bibliographic data into a machine readable information record format based upon the Library of Congress MARC II Communications Format for bibliographic data.

Sub-Line Item 1AA - Design and implement the basic information record format.

Sub-Line Item 1AB - Investigate and test the feasibility of expanding the system to include Library of Congress MARC II data, together with local input of AFCRL data. Investigation and testing the feasibility to output MARC II communication tapes with AFCRL data.

Sub-Line Item 1AC - Monthly, provision of a body of data input in accordance with Sub-line items 1AA and 1AB, and output to support the system in the form of printed catalog cards, prepared physical volumes, and magnetic tapes.

Sub-Line Item 1AD - Investigation and testing expansion of the system design. This may include but is not necessarily limited to designing and testing one or all of the following:

(1) Circulation System
(2) Expanded accountability system
(3) Coordinated acquisition system
(4) Generation of authority lists, bookform lists, etc.
(5) SDI systems
(6) Serial and document cataloging information
(7) Changes in format necessitated by changes in the requirements of the Library of Congress or the AFCRL library system.

Sub-Line 1AE - Reports are required hereunder and shall be prepared in accordance with the "Outline of Reporting Procedures for Air Force Cambridge Research Laboratories Contractors", dated 1 May 67.

DOCUMENT CONTROL DATA - R&D

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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY

13. ABSTRACT

This report describes the system development and testing conducted by Inforonics, Inc. for the AFCRL library, under Contract No. F19628-68-C-0371. This involved development of a system to provide AFCRL with a totally compatible MARC II format bibliographic data handling system.

The central focus of the project was on data encoding and the development of routines, and techniques for the conversion of AFCRL and/or Library of Congress supplied bibliographic data into a machine readable information record format based upon the Library of Congress MARC II Communications Format. Under this contract that system was developed, programmed, and tested.

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